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	PATH	RESV	decision by route
A	1	0	yes
B	0	1	yes
C	0	0	no
D	1	1	yes

(57) Abstract

The present invention describes a protocol with which it is possible to establish a connection suitable for voice communication in a network such as internet. In a first step, a PATH message is transmitted from an initiator (1) to a called station (2). In a second step, an RESV message is transmitted from the called station (2) back to the initiator (1), along the same route (23) followed by the PATH message. If either the initiator (1), or the called station (2), or both, contain information in the PATH message and/or the RESV message that indicates payment willingness, each router (22) along the route (23) will reserve a part of its capacity for a direct connection.

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METHOD AND DEVICE FOR CHARGING COMMUNICATIONS BASED ON RSVP PROTOCOL

The present invention is related to a method and device for communication, in particular two-way communication, more in particular voice communication.

Although the present invention is in particular applicable to
5 two-way voice communication between two persons, and the present invention will be specifically explained below for this application, it is emphasised that the present invention is not restricted to this application.

Two-way voice communication is generally known nowadays in the
10 form of telephone traffic. Two mutually communicating parties make use of a telephone network in that regard, said network being managed by at least one network administrator. The provision of a communication channel between both parties is a service which is offered by the network administrator, and which must be paid for by at least one of
15 both parties. It is usually the calling party, that is, the party upon whose initiative the connection is established and who will be referred to below with the term "initiator", who pays for the connection, the amount of the payment inter alia being dependent upon the distance between both parties and the length of the call, that is,
20 the time during which the connection was maintained.

In the past years the use of personal computers has expanded enormously, and likewise the so-called "internet" has developed into a world-wide network of communication connections between the computers connected thereto. Via said network, computers can exchange data
25 and/or communicate with each other. The information to be transmitted by a computer is guided, via various intermediate stations, to an addressed computer, or to an electronic mailbox from which the addressed computer can retrieve the information at a suitable time. The time duration for the transfer of the information, and the route
30 along which this occurs, is not specified in this regard. In principal it is so, that different parts of the message to be sent can reach their final destination via different routes, and not necessarily in the original order.

Such a manner of communication is, of course, not suitable for
35 real-time voice communication. The various parts of a spoken message must, in relation to each other, arrive at their destination without too great a time delay and in the correct order.

A need exists to use the internet (or similar networks) for voice communication. This implies that a real "connection" must be established between two stations and that provisions must be made to ensure that the various parts of the (digitised) message arrive at their destination within a fixed time, for example 100 ms. To this end a protocol is currently under development, called "Resource Reservation Protocol" (RSVP). By means of this protocol, certain nodes or intermediate stations of the network, referred to below as "routers", are, stating it briefly, instructed to maintain a certain connection: a certain amount of processing capacity of the related routers is, as it were, "reserved".

Although the currently known protocol in itself is quite satisfactory for establishing a connection, it has the disadvantage of not providing facilities for having at least one of the users pay for the established reservation. It is not only particularly useful, from an economic point of view, for the various administrators of the various routers to be able to have at least one of the users pay for the provision of the said service (reservation), but this also has the advantage that the users will only request and maintain the reservation for the duration of the call. If the reservation were "free", it would not be inconceivable that a user continues a given reservation even if it is not used, thus unnecessarily burdening the capacity of the network. If the users have to pay for the reservation, they will sooner tend to cancel the reservation when it is no longer required, so that in fact the capacity of the network for establishing voice communication can be used as efficiently as possible.

A problem which plays a role in this regard is the question who must pay for the connection. In principal this will be the initiator of the connection, but, in an internet or similar network, where a connection is established on the basis of the currently known RSVP protocol, it is not known, in contrast to telephone networks, who the initiator is, as will be discussed in more detail below.

The present invention seeks to provide a solution for this problem.

More in particular, the present invention seeks to provide a protocol which makes it possible that, upon the establishment of the connection, the initiator of the connection can be identified, or that at any rate it can be identified which of the two parties is willing

to pay for the connection.

Yet more in particular, the present invention seeks to make the RSVP protocol suitable for the above-mentioned purpose by providing as few changes as possible.

5 The above-mentioned aspects, characteristics and advantages of the present invention will be further explained by the following description of an embodiment of the protocol according to the present invention, with reference to the drawing, in which:

Fig. 1 diagrammatically illustrates a telephone network;

10 Fig. 2 diagrammatically illustrates internet communication;

Fig. 3 diagrammatically illustrates the establishment of a voice connection via the internet;

Fig. 4 shows a decision table;

and Fig. 5 illustrates a router.

15 With reference to Fig. 1, a telephone connection will now be discussed. Fig. 1 diagrammatically shows a telephone network 9, comprising a number of intermediate stations (switches) 10, as well as a plurality of subscribers, of which only two are shown in Fig. 1, designated by the reference numbers 1 and 2. Fig. 1 shows a situation
20 in which a voice connection, which in general is designated by the reference number 14, is present between the subscribers 1 and 2. The first subscriber 1 is coupled to a first switch 10₁ via a first duplex connection 11. The second subscriber 2 is coupled to a second switch 10₂ via a second duplex connection 12. The two switches 10₁ and 10₂ can
25 be coupled to each other directly or by intermediation by one or several switches 10₃ by means of duplex connections 13; in Fig. 1, one such intermediate switch 10₃ is shown, the switches 10₁ and 10₂ being coupled to said intermediate switch 10₃ via duplex connections 13₁ and 13₂ respectively. It can also occur, however, that the two subscribers
30 1 and 2 are coupled to each other via only one single switch.

Since the construction of a telephone network and the operation of the switches 10 are not the subject of the present invention, and in addition to that are known per se, this will not be further explained. Relevant in regard to the present invention is the manner
35 in which the voice connection between the subscribers 1 and 2 is established, which will now be explained under the assumption that the first subscriber 1 is the initiator and that the second subscriber 2 is the called party. First the duplex connection 11 is established

between the initiator 1 and the first switch 10_1 , the initiator 1 informing the switch 10_1 of the identity (telephone number) of the subscriber 2 with whom he wishes to communicate. Upon the establishment of said duplex connection 11 , the first switch 10_1
5 "knows" that the contact-seeking subscriber 1 is the initiator, and that the connection must be charged to him. Subsequently, the duplex connection 13_1 between the first switch 10_1 and the intermediate switch 10_3 is established, after which the duplex connection 13_2 between the intermediate switch 10_3 and the second switch 10_2 is established. It is
10 always known in that regard that said connection is established at the request of the initiator 1. Finally, the duplex connection 12 between the second switch 10_2 and the called subscriber 2 is established, making the total connection 14 a fact.

It is important in this regard that each of the said connections
15 between the switches 10 mutually, and between the subscribers 1, 2 and the switches 10 , is a duplex connection, and that, at the time a given (partial) connection is established, it is known who the initiator is of said (partial) connection.

It should be observed that, with a telephone connection, a
20 direct communication connection 14 is established between two subscribers, said direct connection being maintained during the course of the call, which can be regarded as capacity reservation. The number and the identity of the intermediate stations 10_3 to be connected do not need to be determined beforehand, but are maintained during the
25 course of the call. It is further observed that this direct connection does not need to be established through a wire connection; wireless telephony or satellite telephony are also instances of a direct connection.

Conventional data transfer via the internet will now be
30 discussed with reference to Fig. 2. The internet is illustrated in Fig. 2, as in the following figures, as a network 20 of separate switching stations $21, 22$, said switching stations also being designated by "router". Each router $21, 22$ can communicate with one or more other routers in the network 20 . The network comprises several
35 subscribers, of which in Fig. 2 again only two are represented. These subscribers 1, 2 are connected via a connection $31, 32$ to a predetermined one of the said routers, respectively designated by the reference numbers 21_1 and 21_2 . When one subscriber 1 wishes to transmit

data to the other subscriber 2, he divides said (digitised) data into several small packages, and tries to transmit said small packages one by one. In doing so, the transmitting subscriber 1 will first transmit a first small package, together with the internet address of the addressed subscriber 2, to the router 21₁ associated with said transmitting subscriber 1. Said router 21₁ will transfer said message to one of the other routers, for example to the router designated in Fig. 2 by the reference number 22₁. Said router 22₁ would in turn transfer the message (i.e. small package plus internet address) to yet another router, for example the router designated in Fig. 2 by the reference number 22₂. Ultimately, said small package can reach the addressed subscriber 2 via the following routers 22₃, 22₄ and 21₂, said small package thus following a path designated by the reference number 23.

It should be observed that, in the conventional data transfer via the network 20 discussed above, no direct connection is established between the subscribers 1 and 2.

A second small package which is sent to the addressed subscriber 2 by the transmitting subscriber 1, does not necessarily need to follow the same route. In Fig. 2, another route 25 is shown, running via the routers 22₅ and 22₆. It will be clear that although all the small packages sent will indeed ultimately arrive at the addressed subscriber 2, the order in which said small packages arrive does not necessarily need to correspond with the order in which said small packages were sent by the transmitting subscriber 1. It should further be clear that the transmission by a router (for example 22₁) of a small data package to a following router (for example 22₂) can only occur when the first-named router 22₁ is ready for transmission, and that it is not apparent beforehand at which point in time that will occur. This implies that it is not known beforehand how long the transmission from the sender 1 to the receiver 2 takes, and that the said periods of time can vary strongly for the various small data packages mutually.

As observed before, the manner of communication via internet illustrated in Fig. 2 is not suitable for establishing a real-time voice connection.

A known protocol which is suitable for establishing a real-time voice connection via internet will now be illustrated with reference

to Fig. 3. In Fig. 3, reference numbers which are the same as in the figures 1 and 2 designate the same or similar parts.

It is again assumed that the first subscriber 1 wishes to establish a connection with the second subscriber 2, and indeed a
5 connection of which the quality is suitable for the transfer of speech. Below, said first subscriber 1 will also be designated by the term "initiator", and the second subscriber 2 will also be designated by the term "called party". For the sake of convenience, it is further assumed that said voice connection follows the route 23 referred to
10 above. The requirement that the connection 23 must have a quality suitable for speech, implies that all the intermediate stations or routers 21_1 , 22_1 to 22_4 (inclusive), 21_2 , which are located along said route 23, must maintain the connection with a predecessor and a successor, or, in other words, must reserve part of their capacity for
15 this connection. This is designated as "Resource Reservation", and a protocol developed to this end is designated as "Resource Reservation Protocol" (RSVP). This known protocol was developed primarily for establishing a connection with a predetermined quality between two stations 1 and 2, in which the second station 2 is a source of
20 information and the first station 1 wishes to receive information from said source 2.

Since said protocol is already known by those skilled in the art, an extensive description of this is not necessary. An example of a description of said protocol has been made available on the internet
25 by the Internet Engineering Task Force (at the address [FTP://DS.INTERNIC.NET/RFC/RFC2205.TXT](ftp://ds.internic.net/rfc/rfc2205.txt)), and said description is deemed to be incorporated by reference in the present application. For the sake of completeness, a copy of said description is included as part of the present application in ANNEX A.

30 The building up of the voice connection according to said RSVP protocol takes place in various set up stages, and is preceded by a contact-seeking stage outside RSVP. At the very first, the initiator 1 transmits an initiation message ALERT over the network 20 to the called station 2. This is an "ordinary" message, transmitted in the
35 manner described with reference to Fig. 2, to inform the called station 2 of the fact that the initiator 1 is seeking contact. On the basis of this message, a signal can be generated at the called station 2, such as for example a telephone ringing signal.

The called station 2 subsequently transmits, in a similar manner, a message CALL ACCEPT, indicating that the call is answered. Hereafter, the quality connection can be built up on the basis of the RSVP protocol.

5 In a first set up stage, the initiator 1 transmits a first message, designated by the term PATH, possibly accompanied by a first data package, to the called station 2, each router along the route 23 passing said message along to the following router. Fig. 3 shows that the router 21₁, associated with the first station 1, passes the PATH
10 message on to the next router 22₁. In a similar manner, the routers 22₂, 22₃, 22₄ and 21₂ receive the PATH message from their predecessor, but for the sake of simplicity that is not shown in Fig. 3. The PATH message can be regarded as a command to the network 20 for establishing an arbitrary route 23 between the subscribers 1 and 2. At
15 the moment that the PATH message reaches the second station 2, there is a set of routers 21₁, 22₁ to 22₄ (inclusive), and 21₂ which "know" each other via the PATH message.

 In a second set up stage, the second station 2 transmits a reservation command to all the routers 21₁, 22₁ to 22₄ (inclusive), 21₂
20 along the route 23, said route 23, as mentioned above, being defined by the PATH messages left behind as a track by said routers. Said reservation command is, in a similar manner as described above in relation to the PATH message, passed on by each router along the route 23 to its predecessor. In Fig. 3, the transmission of the reservation
25 command from the router 21₂ associated with the second station 2 to the preceding router 22₄ is illustrated and designated by the term RESV. The RESV message can be considered as a command to the network 20 to reserve the established route 23 for further use. In a similar manner as discussed above in relation to the PATH message, the transmission
30 of the RESV message for the other parts of the route 23 is not represented for the sake of clarity.

 It is observed that each router only passes the RESV message to a preceding router along said route 23 if the reservation requested by the second station 2 is indeed assigned by the related router. If the
35 RESV message arrives at the first station 1, the first station 1 knows that all the routers along the route 23 have reserved a suitable portion of their capacity in the desired manner, and the first station 1 transmits a confirmation message CONF along the same route 23 to the

second station 2. This confirmation message CONF is also passed along the route 23 by all routers to the next router; for the sake of clarity, this passing is illustrated in Fig. 3 only for the routers 22₁ and 22₂.

5 When said CONF message arrives at the second station 2, the second station 2 also knows that the desired route is reserved. It should otherwise be clear that the CONF message is not essential for the establishment of the requested reservation.

10 In fact, a real connection has now been established between the first station 1 and the second station 2, data communication and even voice communication being possible via said route 23. A complication in this regard is that said route 23 is a simplex connection, that is, said route 23 is only suitable for transmission of data from the first station 1 to the second station 2 (in relation to this simplex
15 connection, the first station 1 can also be designated as sender and the second station 2 can also be designated as receiver). For voice communication in two directions, this is, of course, insufficient, and a second simplex route 43 must be established between the two stations 1 and 2, second simplex route 43 being suitable for voice
20 communication from the second station 2 (sender) to the first station 1 (receiver). An example of such a second simplex route 43 is also shown in Fig. 3. This route is set up in a similar manner as said route 23, be it that the PATH messages are transmitted from the second station 2, that the RESV messages are transmitted from the first
25 station 1, and that the CONF messages are transmitted from the second station 2, all thus being opposite to the setting up of the first-named route 23.

30 The said RSVP protocol works satisfactorily, be it that the protocol is indeed suitable for setting up a double simplex quality connection between the two stations 1 and 2. In this known protocol, no means have been provided to have the stations 1 and/or 2 pay for the requested reservation. If the requested reservation is free of charge, there is no reason for the stations 1 and 2 to cancel the assigned reservation when it is no longer needed, so that said
35 reservation can be maintained longer than necessary, which implies an inefficient use of the capacity of said network 20. It is an objective of the present invention to increase the efficiency of the use of said network 20 by stimulating the users of said network 20 to cancel an

assigned reservation as soon as possible.

A complication in this regard is that those costs must be charged to one of the mutually communicating stations 1 and 2, but that no information is available on the routers with respect to the question which of said stations 1, 2 is to receive the bill. In first instance, it would seem logical to charge the costs to the initiator of the voice connection 23, 43, said initiator being the first station 1 in the example sketched, but the routers along the two routes 23, 43 do not "know" which of the two stations 1 and 2 is the initiator. The routers along the first route 23 receive a PATH message originating from the first station 1 (the initiator in its capacity as sender), while the routers along the second route 43 receive a PATH message originating from the second station 2 (the called party in the capacity of sender). Since the routers do not know whether they belong to a "first" route 23 or a "second" route 43, they therefore cannot draw a conclusion from the origin of the PATH message regarding the identity of the initiator. The same applies, mutatis mutandis, for the RESV messages and the CONF messages. The present invention seeks to provide a solution for this problem.

According to an important aspect of the present invention, a code is added in at least one of the said messages PATH, RESV, CONF which is indicative of the degree in which the sender of said message is willing to bear the costs of the reservation.

According to a further important aspect of the present invention, the routers are set up to take said information into account upon taking a decision with respect to the assignment of the requested reservation. More in particular, each router is set up to assign the requested reservation only in the event that for at least one of the two call partners willingness has been expressed to bear the costs.

The above-mentioned aspects of the present invention will now be further explained with reference to the Figs. 3 and 4. On setting up the voice connection, the known RSVP protocol, which will not be further explained here since it is known per se, can be used in the manner discussed above with reference to Fig. 3. The precise form and content of the PATH, RESV, and CONF messages, too, are not relevant for a proper understanding of the present invention, and likewise will therefore not be discussed. It will suffice to remark that said

messages can be identical to the known messages, except that at least one information location has been added thereto. In a simple embodiment, said additional information location has a length of only one bit. Said additional bit will be designated below by the term initiator bit. The value of said bit in the message indicates whether the sender of said message is or is not willing to bear the costs of the call. In the example to be discussed below, it is assumed that the value "1" of the initiator bit indicates payment willingness, and that the value "0" of the initiator bit indicates that the sender is not willing to bear the costs, but it will be clear that this can be reversed if desired.

It will now again be assumed that the first station 1 is the initiator of the voice connection to be set up between the two stations 1 and 2, and that said first station 1, as initiator, is prepared, as usual, to bear the costs of the call. This means that the initiator bit, in the PATH message to be transmitted by the first station 1, has the value of "1". After the route 23 has been established, all routers 21_1 , 22_1 to 22_4 (inclusive), 21_2 along said route 23 have in their memory a PATH message of which the initiator bit has value "1". Hereafter, the second station 2, as discussed before, transmits an RESV message along the route 23. Since the second station 2 is the called station, that is, is not the initiator of the voice connection to be set up, the second station 2 sets the value of the initiator bit in the RESV message to "0".

The router 21_2 related to the second station 2 receives this reservation request, and must now take a decision regarding the reservation to be assigned. The router 21_2 thereto bases itself respectively on the two initiator bits of the PATH message in its memory and the RESV message it just received from the second station 2. Since the initiator bit of the PATH message has the value of "1", the requested reservation can be assigned. This is designated in Fig. 4 by A. In a similar manner, the other routers along the route 23 take the same decision as the router 21_2 , so that the requested reservation is established along the whole route 23. Thereafter, as described before, the CONF message is transmitted by the first station 1 to the second station 2.

For the setting up of the other route 43, the second station 2 transmits a PATH message, which is passed along the route 43 by the

5 routers 21_2 , 42_1 to 42_4 (inclusive), 21_1 . Since the second station 2 is the sender with respect to the route 43 to be established and as such takes the initiative for setting up this route, but is not the initiator of the voice connection to be set up in general, the second station 2 sets the initiator bit in this PATH message to the value "0".

10 Subsequently, the first station 1 transmits an RESV message to the next station 21_1 along the route 43. Since the first station 1 is the initiator of the voice connection to be set up in general between the stations 1 and 2, said first station 1 sets the initiator bit in the RESV message to the value "1". Said router 21_1 must now take a decision regarding the reservation to be assigned on the basis of the PATH message present in its memory and the RESV message received from said first station 1. Although the value of the initiator bit in the
15 PATH message stored in its memory is indeed equal to "0", the value of the initiator bit in the RESV message received from the first station 1 is equal to "1", so that the requested reservation can be assigned. This is illustrated in Fig. 4 by B.

20 The example discussed above shows that, under normal circumstances, the value of the initiator bit to be transmitted is associated with the two-way voice connection being initiator or not. This does not always have to be the case, however, as will be explained below.

25 In normal telephone traffic, the concept "collect call" is known, that is, a call is requested by an initiator while the called party is asked whether he is willing to bear the costs of the call. In principal, this is also possible in the protocol suggested by the present invention, namely by setting the value of the initiator bits in a suitable manner. The value of the initiator bits, then, is not as
30 much related to being initiator of the requested voice connection or not, as to the willingness to pay for the requested reservation. In other words, the initiator bit can also be designated by the term payment willingness bit.

35 On setting up a "collect call" voice connection from the first station 1, the PATH messages of the first station 1 will have an initiator bit of which the value is "0". If said called station 2 is indeed willing to bear the costs of the requested reservation, the RESV messages to be transmitted by said second station 2 will have an

initiator bit or payment willingness bit of which the value is "1". It will be clear for those skilled in the art that the requested reservation along said route 23 is established on the basis of the conditions indicated in Fig. 4 by B, and that the requested reservation along the other route 43 is established on the basis of the condition shown by A.

If said second station 2, however, is not willing to bear the costs of the requested reservation of the voice connection initiated by said station 1, said second station 2 answers with an RESV message of which the initiator bit has the value of "0". The router 21₂ will now not assign the requested reservation, since the value of the initiator bits of the PATH message stored in its memory and of the RESV message received from the second station 2 are both equal to "0", which is designated in Fig. 4 by C.

In that case, said router 21₂ will also not pass the RESV message further to the preceding router 22₄. The router 21₂ can, instead of that, return an error message to the second station 2 indicating that the requested capacity reservation was not established, simultaneously also providing a reason for the same.

It is, of course, not inconceivable that both stations 1 and 2 are willing to pay for the requested reservation. In that case, the initiator bits of both PATH and RESV messages will have the value of "1". The routers then too will assign the requested reservation, as illustrated in Fig. 4 by D.

Fig. 5 illustrates a number of details of the construction of a router, which in Fig. 5 are designated in general by the reference number 21. The router 21 comprises two communication connections 101 and 102, with which said router 21 in said network 20 can be coupled with other routers. Said router 21 is provided with the means designated by reference number 110 in general for establishing a connection suitable for speech between the communication connections 101 and 102, said means being controlled by a control unit 103. The control unit 103 is coupled to said communication connections 101 and 102 in order to receive messages, such as said PATH, RESV and CONF messages, arriving at the said connections. Associated with the control unit 103 is a memory 104, in which the control unit 103 can store data.

If at one of said communication connections a PATH message is

received by the control unit 103, said control unit 103 will analyse said PATH message with respect to the payment willingness information present therein, and will store in said memory 104 data which represents said payment willingness information. Said control unit 103
5 subsequently transmits said PATH message via another communication connection through to a following router.

If an RESV message is received at the said other communication connection, the control unit 103 analyses said RESV message with respect to the payment willingness information present therein. The
10 control unit 103 further consults said memory 104 with respect to the said previously stored data. If at least one of said data from said memory 104 and the payment willingness information in the RESV message indicates payment willingness, said control unit 103 controls the said means 110 such that at least a part of the capacity of the means 110
15 is reserved for a direct connection between said communication connections 101 and 102, and said control unit 103 will transmit the RESV message, via the former communication connection through to the router from which initially the named PATH message was received.

In the above, it was explained how the requested reservation of
20 a certain route between two stations can be assigned or rejected on the basis of the apparent payment willingness of at least one of said stations. A following aspect is the actual on-charging of costs for the established reservation, where said costs will be dependent upon various factors. The manner in which said costs are calculated and
25 charged to one of said stations 1, 2, is not the subject of the present invention and will therefore not be further explained here. It will suffice to remark that the PATH message not only contains information regarding the identity of the addressee, but also regarding the identity of the sender of said PATH message; the same
30 applies for the RESV message. This implies that, in principal, each router which is involved with said routes 23 and 43 is able, on the basis of the information in the PATH and RESV messages, and on the basis of a rate to be determined by the router itself, to determine on the one hand what the costs are of the established reservation, and to
35 determine on the other hand to whom said costs must be charged. Thus, in principal, each router along said routes 23 and 43 could send an invoice to said initiator 1, or, in the case of "collect call", to said called party 2.

In this regard it is further observed that, in the case designated in Fig. 4 by D, where both call partners 1, 2 are willing to pay for the established reservation, the routers along said routes 23 and 43 can choose to charge the costs of the established reservation to the sender of the PATH message, the sender of the RESV message, or to both at half rate.

It will be clear for a person skilled in the art that the present invention is not restricted to the examples discussed above, and that various variations and modifications in the examples discussed are possible without departing from the scope of the invention as defined in the appended claims.

Thus it is possible, for example, that the information in the payment willingness field indicates a part of the costs which the sender is willing to pay, for example expressed in a percentage of the costs or as an absolute amount. In that case, a router will only assign the requested reservation if the willingness of both call partners together corresponds to at least 100% of the reservation costs.

It is observed that the present invention is discussed above for the world-wide internet, but that the present invention is also applicable to communication via other networks, for example local, regional or national networks. The invention is, in fact, applicable to each IP-network in which minimally simplex connections are possible.

It is further observed that "reservation" does not mean that a router is fully occupied. It is therefore very well possible that said routes 23 and 43 have one or more routers in common, or are even identical.

CLAIMS

1. Method for establishing a connection (23; 43) suitable for communication in at least one direction between two subscriber stations (1; 2) in a communication network (20) comprising a plurality of switching stations or routers (21; 22; 42), in which a first subscriber station (1) and a second subscriber station (2) are connected with a predetermined router (21₁ and 21₂ respectively), and in which each router (21; 22; 42) can communicate with at least some of the other routers in the network;
- 10 in which said connection (23) runs via at least one of the said routers, each router (for example 22₂) being connected to a corresponding previous station or router (for example 22₁) and/or a corresponding next station or router (for example 22₃);
- 15 in which the first station (1) transmits a first message to the second station (2) via a first route (23) comprising at least one router (21₁), said first message containing first payment willingness information;
- 20 in which the second station (2), in response to the reception of the first message, transmits a second message back to the first station (1) via the said first route (23), the said second message containing second payment willingness information;
- 25 in which a router (for example 21₂) receiving the second message, if at least one of the first and the second payment willingness information entities has a predetermined value which is indicative of payment willingness, reserves at least a part of its communication capacity for direct connection with previous and following stations and/or routers (22₄; 2) related to said router (21₂).
2. Method according to Claim 1, in which a router (for example 21₂) receiving the second message, if at least one of the first and the second payment willingness information entities has a predetermined value indicative of payment willingness, also transmits the second message to the previous router or station (22₄) related to said router (21₂), which is repeated until said second message arrives at the first station (1).
3. Method according to Claim 1 or 2, in which the first station (1), in response to the reception of the second message, transmits a third message to the second station (2) via the said route (23).
4. Method according to Claim 1, 2 or 3, in which the said first

subscriber station (1) is the initiator of the connection (23) to be established and the said second subscriber station (2) is the called station, in which the first payment willingness information has a predetermined first value which is indicative of payment willingness and in which the second payment willingness information has a second value which is different from said predetermined first value.

5 5. Method according to Claim 1, 2 or 3, in which the said first subscriber station (1) is initiator of the connection (23) to be established and the said second subscriber station (2) is the called
10 station, and in which, in the case of "collect call", the second payment willingness information has a predetermined first value which is indicative of payment willingness and the first payment willingness information has a second value which is different from said predetermined first value.

15 6. Method according to Claim 1, 2 or 3, in which the said second subscriber station (2) is the initiator of the connection to be established and the said first station (1) is the called station, in which the second payment willingness information has a predetermined first value which is indicative of payment willingness and the first
20 payment willingness information has a second value which is different from the said predetermined first value.

7. Method according to Claim 1, 2 or 3, in which the said second subscriber station (2) is the initiator for the connection to be established and the said first subscriber station (1) is the called
25 station, in which, in the case of "collect call", the first payment willingness information has a predetermined first value which is indicative of payment willingness and the second payment willingness information has a second value which is different from said predetermined first value.

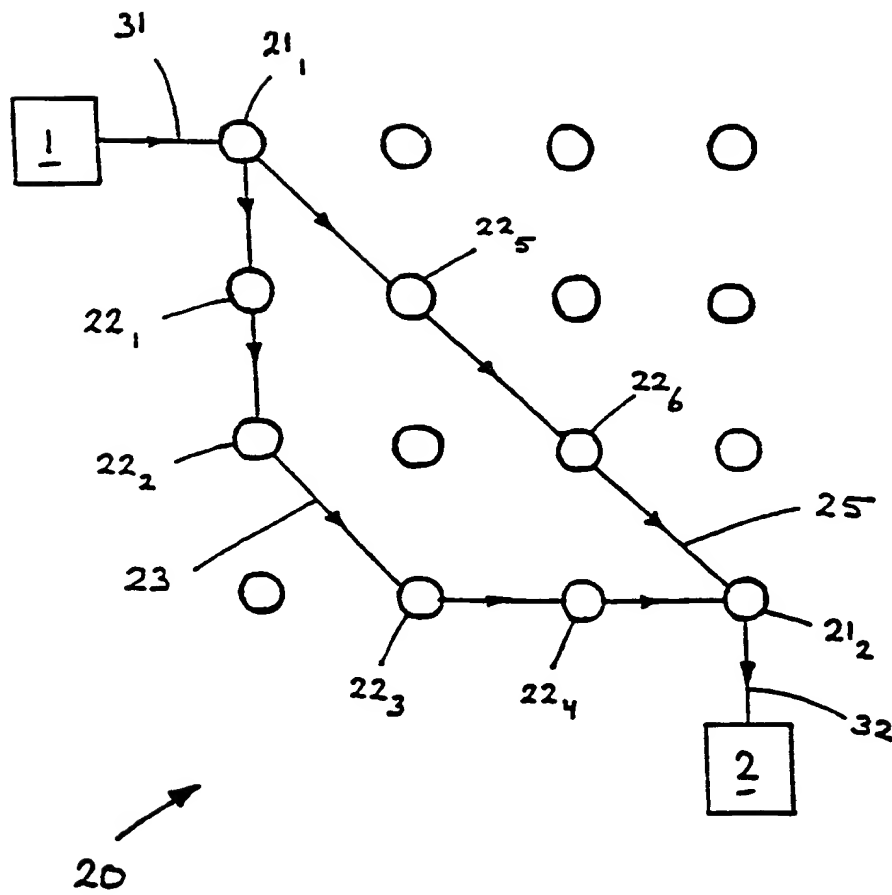
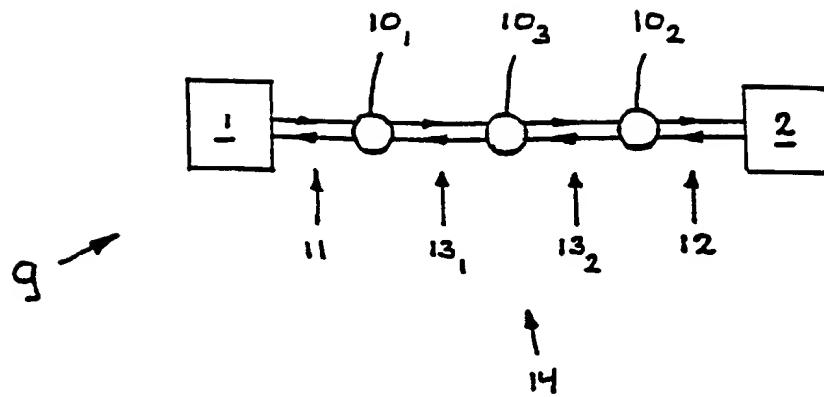
30 8. Router, suitable for inclusion in a network (20), comprising:
at least two communication connections (101, 102);
means (110) for establishing a connection between said communication connections (101, 102);
a control unit (103), coupled to the said communication connections,
35 which is arranged for controlling said means (110);
a memory (104) coupled to the control unit (103);
in which the control unit (103), in response to the reception of a first message at one of said communication connections, is arranged

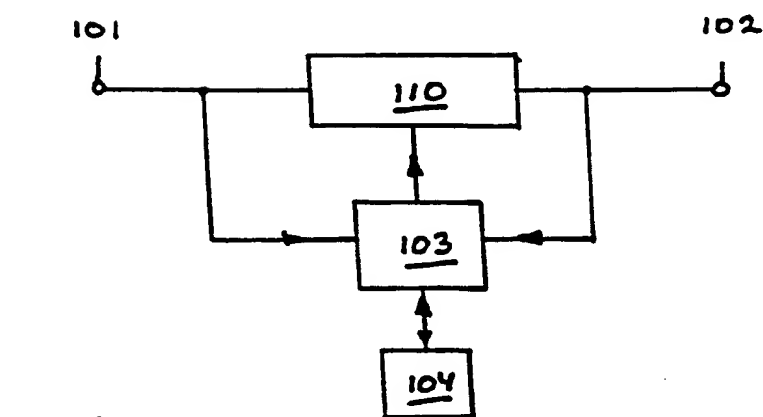
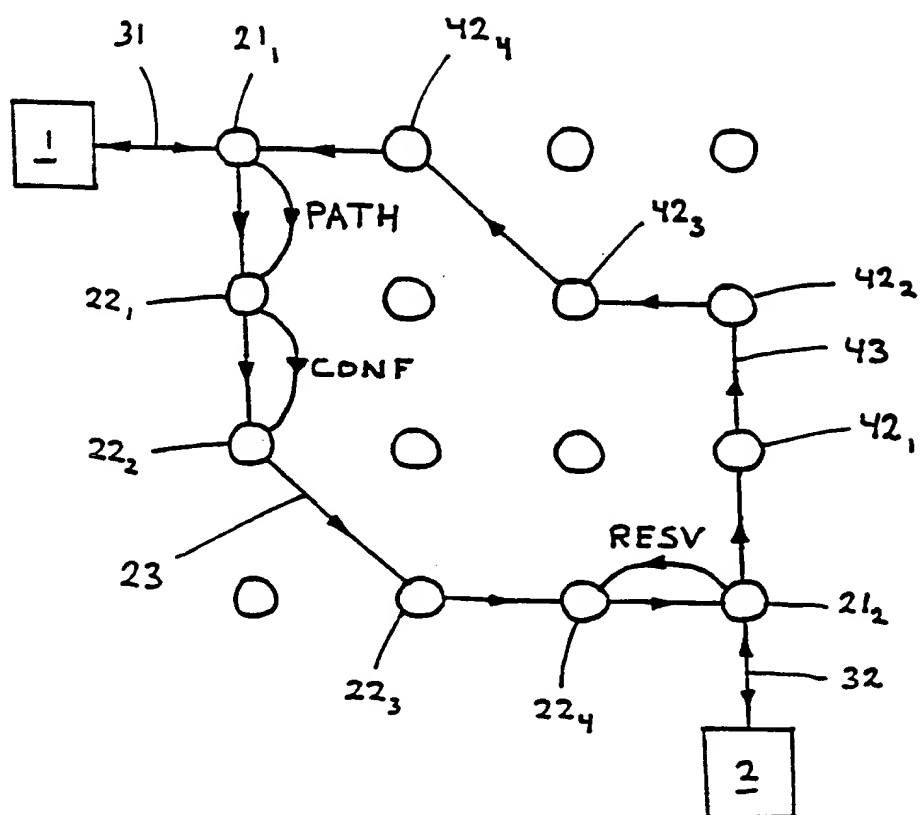
for storing in the said memory (104) data which is representative of the payment willingness information present in said first message, and for transmitting the first message to a following router via another communication connection;

5 in which the control unit (103), in response to the reception of a second message at the said other communication connection, is arranged, if at least one of the data stored in the said memory (104) and the payment willingness information present in the received second message has a value which is indicative of payment willingness, for
10 reserving at least a part of the capacity of the means (110) for a direct connection between said communication connections (102) and (101).

9. Router according to Claim 8, in which the control unit (103), in response to the reception of the second message at the said other
15 communication connection, is arranged, if at least one of the data stored in the said memory (104) and the payment willingness information present in the received second message has a value which is indicative of payment willingness, for transmitting the second message via the first-named communication connection (101) to the
20 previous router.

1/3





3/3

	PATH	RESV	decision by route
A	1	0	yes
B	0	1	yes
C	0	0	no
D	1	1	yes

FIG. 4

PATENT COOPERATION TREATY

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INTERNATIONAL SEARCH REPORT

(PCT Article 18 and Rules 43 and 44)

Applicant's or agent's file reference 402462W0	FOR FURTHER ACTION see Notification of Transmittal of International Search Report (Form PCT/ISA/220) as well as, where applicable, item 5 below.	
International application No. PCT/EP 98/ 07800	International filing date (day/month/year) 02/12/1998	(Earliest) Priority Date (day/month/year) 05/12/1997
Applicant KONINKLIJKE KPN N.V. et al.		

This International Search Report has been prepared by this International Searching Authority and is transmitted to the applicant according to Article 18. A copy is being transmitted to the International Bureau.

This International Search Report consists of a total of 3 sheets.
☒ It is also accompanied by a copy of each prior art document cited in this report.

1. Basis of the report

- a. With regard to the **language**, the international search was carried out on the basis of the international application in the language in which it was filed, unless otherwise indicated under this item.
- ☐ the international search was carried out on the basis of a translation of the international application furnished to this Authority (Rule 23.1(b)).
- b. With regard to any **nucleotide and/or amino acid sequence** disclosed in the international application, the international search was carried out on the basis of the sequence listing :
- ☐ contained in the international application in written form.
- ☐ filed together with the international application in computer readable form.
- ☐ furnished subsequently to this Authority in written form.
- ☐ furnished subsequently to this Authority in computer readable form.
- ☐ the statement that the subsequently furnished written sequence listing does not go beyond the disclosure in the international application as filed has been furnished.
- ☐ the statement that the information recorded in computer readable form is identical to the written sequence listing has been furnished
2. ☐ **Certain claims were found unsearchable** (See Box I).
3. ☐ **Unity of invention is lacking** (see Box II).

4. With regard to the title,

- ☐ the text is approved as submitted by the applicant.
- ☒ the text has been established by this Authority to read as follows:

METHOD AND DEVICE FOR CHARGING COMMUNICATIONS BASED ON RSVP PROTOCOL

5. With regard to the abstract,

- ☒ the text is approved as submitted by the applicant.
- ☐ the text has been established, according to Rule 38.2(b), by this Authority as it appears in Box III. The applicant may, within one month from the date of mailing of this international search report, submit comments to this Authority.

6. The figure of the drawings to be published with the abstract is Figure No.

- ☒ as suggested by the applicant. 4
- ☐ because the applicant failed to suggest a figure. ☐ None of the figures.
- ☐ because this figure better characterizes the invention.

NOTES TO FORM PCT/ISA/220 (continued)

The letter must indicate the differences between the claims as filed and the claims as amended. It must, in particular, indicate, in connection with each claim appearing in the international application (it being understood that identical indications concerning several claims may be grouped), whether

- (i) the claim is unchanged;
- (ii) the claim is cancelled;
- (iii) the claim is new;
- (iv) the claim replaces one or more claims as filed;
- (v) the claim is the result of the division of a claim as filed.

The following examples illustrate the manner in which amendments must be explained in the accompanying letter:

1. [Where originally there were 48 claims and after amendment of some claims there are 51]:
"Claims 1 to 29, 31, 32, 34, 35, 37 to 48 replaced by amended claims bearing the same numbers; claims 30, 33 and 36 unchanged; new claims 49 to 51 added."
2. [Where originally there were 15 claims and after amendment of all claims there are 11]:
"Claims 1 to 15 replaced by amended claims 1 to 11."
3. [Where originally there were 14 claims and the amendments consist in cancelling some claims and in adding new claims]:
"Claims 1 to 6 and 14 unchanged; claims 7 to 13 cancelled; new claims 15, 16 and 17 added." or
"Claims 7 to 13 cancelled; new claims 15, 16 and 17 added; all other claims unchanged."
4. [Where various kinds of amendments are made]:
"Claims 1-10 unchanged; claims 11 to 13, 18 and 19 cancelled; claims 14, 15 and 16 replaced by amended claim 14; claim 17 subdivided into amended claims 15, 16 and 17; new claims 20 and 21 added."

"Statement under article 19(1)" (Rule 46.4)

The amendments may be accompanied by a statement explaining the amendments and indicating any impact that such amendments might have on the description and the drawings (which cannot be amended under Article 19(1)).

The statement will be published with the international application and the amended claims.

It must be in the language in which the international application is to be published.

It must be brief, not exceeding 500 words if in English or if translated into English.

It should not be confused with and does not replace the letter indicating the differences between the claims as filed and as amended. It must be filed on a separate sheet and must be identified as such by a heading, preferably by using the words "Statement under Article 19(1)."

It may not contain any disparaging comments on the international search report or the relevance of citations contained in that report. Reference to citations, relevant to a given claim, contained in the international search report may be made only in connection with an amendment of that claim.

Consequence if a demand for international preliminary examination has already been filed

If, at the time of filing any amendments under Article 19, a demand for international preliminary examination has already been submitted, the applicant must preferably, at the same time of filing the amendments with the International Bureau, also file a copy of such amendments with the International Preliminary Examining Authority (see Rule 62.2(a), first sentence).

Consequence with regard to translation of the international application for entry into the national phase

The applicant's attention is drawn to the fact that, where upon entry into the national phase, a translation of the claims as amended under Article 19 may have to be furnished to the designated/elected Offices, instead of, or in addition to, the translation of the claims as filed.

For further details on the requirements of each designated/elected Office, see Volume II of the PCT Applicant's Guide.

INTERNATIONAL SEARCH REPORT

National Application No

PCT/EP 98/07800

A. CLASSIFICATION OF SUBJECT MATTER

IPC 6 H04M7/00 H04M15/00 H04L12/14

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

IPC 6 H04L H04M

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
P,X	KARSTEN M; SCHMITT J; WOLF L; STEINMETZ R;: "An embedded charging approach for RSVP" 1998 SIXTH INTERNATIONAL WORKSHOP ON QUALITY OF SERVICE (IWQOS'98), 18 - 20 May 1998, pages 91-100, XP002097612 Napa, CA, USA see the whole document ---	1-9
A	WO 97 33404 A (LELEU JEAN LUC) 12 September 1997 see page 13, line 18 - page 14, line 22 see figure 4 --- -/--	1-9



Further documents are listed in the continuation of box C.



Patent family members are listed in annex.

Special categories of cited documents:

"A" document defining the general state of the art which is not considered to be of particular relevance

"E" earlier document but published on or after the international filing date

"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)

"O" document referring to an oral disclosure, use, exhibition or other means

"P" document published prior to the international filing date but later than the priority date claimed

"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention

"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone

"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art.

"&" document member of the same patent family

Date of the actual completion of the international search

23 March 1999

Date of mailing of the international search report

08/04/1999

Name and mailing address of the ISA

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Fax: (+31-70) 340-3016

Authorized officer

Megalou, M

INTERNATIONAL SEARCH REPORT

International Application No

PCT/EP 98/07800

C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT

Category	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	WO 97 37462 A (BRITISH TELECOMM ; LYNCH AIRD NICOLAS JAMES (GB)) 9 October 1997 see page 5, line 3 - page 6, line 34 see page 10, line 2 - page 11, line 25 see figure 4 ----	1-9
A	WO 97 13352 A (NORTHERN TELECOM LTD) 10 April 1997 see page 23, line 27 - page 28, line 5; figure 6 ----	1-9
A	US 5 623 405 A (ISONO OSAMU) 22 April 1997 see the whole document ----	1-9
A	HONGXIA YANG ET AL: "Application of MAS in implementing rational IP routers on the priced Internet" MULTI-AGENT SYSTEMS, METHODOLOGIES AND APPLICATIONS. SECOND AUSTRALIAN WORKSHOP ON DISTRIBUTED ARTIFICIAL INTELLIGENCE. SELECTED PAPERS, MULTI-AGENT SYSTEMS. METHODOLOGIES AND APPLICATIONS. SECOND AUSTRALIAN WORKSHOP ON DISTRIBUTED ARTIFICIAL INTELLI, pages 166-180, XP002072392 ISBN 3-540-63412-6, 1997, BERLIN, GERMANY, SPRINGER-VERLAG, GERMANY see page 176, paragraph 5 - page 178, paragraph 6 ----	1-9
A	EDELL R J ET AL: "BILLING USERS AND PRICING FOR TCP" IEEE JOURNAL ON SELECTED AREAS IN COMMUNICATIONS, vol. 13, no. 7, 1 September 1995, pages 1162-1175, XP000525655 ----	1-9
A	ROBERTS E: "RSVP: a priority problem?" DATA COMMUNICATIONS INTERNATIONAL, 21 MAY 1997, MCGRAW-HILL, USA, vol. 26, no. 7, pages 58, 60-62, 64, XP002072393 ISSN 0363-6399 -----	

INTERNATIONAL SEARCH REPORT

Information on patent family members

International Application No

PCT/EP 98/07800

Patent document cited in search report		Publication date	Patent family member(s)	Publication date
WO 9733404	A	12-09-1997	FR 2745966 A	12-09-1997
			AU 2031197 A	22-09-1997
			CA 2248789 A	12-09-1997
			EP 0885504 A	23-12-1998
WO 9737462	A	09-10-1997	AU 2168797 A	22-10-1997
			EP 0890239 A	13-01-1999
			NO 984515 A	28-09-1998
WO 9713352	A	10-04-1997	AU 694682 B	23-07-1998
			AU 6729596 A	28-04-1997
			AU 8948898 A	14-01-1999
			CA 2228661 A	10-04-1997
			EP 0852872 A	15-07-1998
US 5623405	A	22-04-1997	JP 5030132 A	05-02-1993
			CA 2074413 A,C	25-01-1993
			DE 69222815 D	27-11-1997
			DE 69222815 T	19-03-1998
			EP 0525632 A	03-02-1993

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INTERNATIONAL PRELIMINARY EXAMINATION REPORT

(PCT Article 36 and Rule 70)

Applicant's or agent's file reference 402462WO	FOR FURTHER ACTION	See Notification of Transmittal of International Preliminary Examination Report (Form PCT/IPEA/416)
International application No. PCT/EP98/07800	International filing date (day/month/year) 02/12/1998	Priority date (day/month/year) 05/12/1997
International Patent Classification (IPC) or national classification and IPC H04M7/00		
Applicant KONINKLIJKE KPN N.V. et al.		

1. This international preliminary examination report has been prepared by this International Preliminary Examining Authority and is transmitted to the applicant according to Article 36.


2. This REPORT consists of a total of 5 sheets, including this cover sheet.

- ☒ This report is also accompanied by ANNEXES, i.e. sheets of the description, claims and/or drawings which have been amended and are the basis for this report and/or sheets containing rectifications made before this Authority (see Rule 70.16 and Section 607 of the Administrative Instructions under the PCT).

These annexes consist of a total of 6 sheets.

3. This report contains indications relating to the following items:

- I ☒ Basis of the report
- II ☐ Priority
- III ☐ Non-establishment of opinion with regard to novelty, inventive step and industrial applicability
- IV ☐ Lack of unity of invention
- V ☒ Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement
- VI ☒ Certain documents cited
- VII ☐ Certain defects in the international application
- VIII ☐ Certain observations on the international application

Date of submission of the demand 01/07/1999	Date of completion of this report 24.03.2000
Name and mailing address of the international preliminary examining authority:  European Patent Office D-80298 Munich Tel. +49 89 2399 - 0 Tx: 523656 epmu d Fax: +49 89 2399 - 4465	Authorized officer Dominguez, I Telephone No. +49 89 2399 2232



INTERNATIONAL PRELIMINARY EXAMINATION REPORT

International application No. PCT/EP98/07800

I. Basis of the report

1. This report has been drawn on the basis of (*substitute sheets which have been furnished to the receiving Office in response to an invitation under Article 14 are referred to in this report as "originally filed" and are not annexed to the report since they do not contain amendments.*):

Description, pages:

1,3-5,7-14	as originally filed			
2,2a,6	as received on	05/02/2000	with letter of	03/02/2000

Claims, No.:

1-9	as received on	05/02/2000	with letter of	03/02/2000
-----	----------------	------------	----------------	------------

Drawings, sheets:

1/3-3/3	as originally filed
---------	---------------------

2. The amendments have resulted in the cancellation of:

- ☐ the description, pages:
- ☐ the claims, Nos.:
- ☐ the drawings, sheets:

3. ☐ This report has been established as if (some of) the amendments had not been made, since they have been considered to go beyond the disclosure as filed (Rule 70.2(c)):

4. Additional observations, if necessary:

**INTERNATIONAL PRELIMINARY
EXAMINATION REPORT**

International application No. PCT/EP98/07800

V. Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

1. Statement

Novelty (N)	Yes:	Claims	1-9
	No:	Claims	NONE
Inventive step (IS)	Yes:	Claims	1-9
	No:	Claims	NONE
Industrial applicability (IA)	Yes:	Claims	1-9
	No:	Claims	NONE

2. Citations and explanations

see separate sheet

VI. Certain documents cited

1. Certain published documents (Rule 70.10)

and / or

2. Non-written disclosures (Rule 70.9)

see separate sheet

Concerning section V (reasoned statement under Article 35(2))

1. The application concerns a method and device for communication, in particular a method for establishing a connection between two subscriber stations in a communication network comprising a plurality of switching stations or routers, and a router suitable to carry out said method.

More in particular, the application addresses the problem of establishing voice communication over a network such as internet, by using the Resource Reservation Protocol (RSVP), wherein capacity is reserved for the communication as soon as one of the parties indicates its willingness to pay for it.

2. All of the documents cited in the International Search Report deal with the problem of establishing a voice connection over a data network and billing for this connection. For example, WO-97-37462 describes a communication network which includes a communication monitoring point arranged to monitor user identifiers to determine the charging scheme.

However, none of these documents (except for the document mentioned in section VI below) uses the above mentioned RSVP to establish the voice connections over the data network, and they are, therefore, not concerned with the problem that this application intends to solve.

Indeed, the currently known RSVP protocol has the disadvantage of not providing facilities for having at least one of the users pay for the established connection. This leads not only to economical problems (since it is difficult for the administrators of the routers to charge for their services), but also to efficiency problems, since users would tend to shorten the reservation if they have to pay for it.

3. The method and device proposed in the application solve these problems by adding a code in some of the messages used to set up the RSVP connection, which is indicative of the degree in which the sender of said message is willing to bear the costs of the reservation. In this way, the routers on the path from one station to the others know exactly if any of the two parties wishes to pay, and which, and take this information into account upon taking a decision with respect to the assignment of the requested

**INTERNATIONAL PRELIMINARY
EXAMINATION REPORT - SEPARATE SHEET**

International application No. PCT/EP98/07800

reservation, i.e. each router is set up to assign the requested reservation only if at least one of the parties has expressed willingness to bear the costs.

4. None of the available prior art documents gives any indication that would lead a person skilled in the art to the solution proposed in the application.
5. It is therefore considered that independent claims 1 and 8 meet the requirements of Articles 33(2), (3) and (4) PCT regarding novelty, inventive step and industrial applicability.
6. Claims 2 to 7 and 9 contain further details of the method and router of claims 1 and 8, respectively. As they are dependent on these claims, they also meet the requirements of Articles 33 (2), (3) and (4) PCT regarding novelty, inventive step and industrial applicability.

Concerning section VI (certain documents cited)

The priority document pertaining to the present application was not available at the time of establishing this first written opinion. Hence, it is based on the assumption that all claims enjoy priority rights from the filing date of the priority document. If it later turns out that this is not correct, the document by Karsten et al. cited in the International Search Report could become relevant to assess whether the claims satisfy the criteria set forth in Article 33 (1) PCT.

A need exists to use the internet (or similar networks) for voice communication. This implies that a real "connection" must be established between two stations and that provisions must be made to ensure that the various parts of the (digitised) message arrive at their destination within a fixed time, for example 100 ms. To this end a protocol is currently under development, called "Resource Reservation Protocol" (RSVP). By means of this protocol, certain nodes or intermediate stations of the network, referred to below as "routers", are, stating it briefly, instructed to maintain a certain connection: a certain amount of processing capacity of the related routers is, as it were, "reserved".

Although the currently known protocol in itself is quite satisfactory for establishing a connection, it has the disadvantage of not providing facilities for having at least one of the users pay for the established reservation. It is not only particularly useful, from an economic point of view, for the various administrators of the various routers to be able to have at least one of the users pay for the provision of the said service (reservation), but this also has the advantage that the users will only request and maintain the reservation for the duration of the call. If the reservation were "free", it would not be inconceivable that a user continues a given reservation even if it is not used, thus unnecessarily burdening the capacity of the network. If the users have to pay for the reservation, they will sooner tend to cancel the reservation when it is no longer required, so that in fact the capacity of the network for establishing voice communication can be used as efficiently as possible.

A problem which plays a role in this regard is the question who must pay for the connection. In principal this will be the initiator of the connection, but, in an internet or similar network, where a connection is established on the basis of the currently known RSVP protocol, it is not known, in contrast to telephone networks, who the initiator is, as will be discussed in more detail below.

The present invention seeks to provide a solution for this problem.

More in particular, the present invention seeks to provide a protocol which makes it possible that, upon the establishment of the connection, the initiator of the connection can be identified, or that at any rate it can be identified which of the two parties is willing

to Fig. 3. In Fig. 3, reference numbers which are the same as in the figures 1 and 2 designate the same or similar parts.

It is again assumed that the first subscriber 1 wishes to establish a connection with the second subscriber 2, and indeed a
5 connection of which the quality is suitable for the transfer of speech. Below, said first subscriber 1 will also be designated by the term "initiator", and the second subscriber 2 will also be designated by the term "called party". For the sake of convenience, it is further
10 assumed that said voice connection follows the route 23 referred to above. The requirement that the connection 23 must have a quality suitable for speech, implies that all the intermediate stations or routers 21₁, 22₁ to 22₄ (inclusive), 21₂, which are located along said route 23, must maintain the connection with a predecessor and a
15 successor, or, in other words, must reserve part of their capacity for this connection. This is designated as "Resource Reservation", and a protocol developed to this end is designated as "Resource Reservation Protocol" (RSVP). This known protocol was developed primarily for establishing a connection with a predetermined quality between two
20 stations 1 and 2, in which the second station 2 is a source of information and the first station 1 wishes to receive information from said source 2.

Since said protocol is already known by those skilled in the art, an extensive description of this is not necessary. An example of a description of said protocol has been made available on the internet
25 by the Internet Engineering Task Force (at the address FTP://DS.INTERNIC.NET/RFC/RFC2205.TXT), and said description is deemed to be incorporated by reference in the present application. For the sake of completeness, a copy of said description is included as part of the present application in ANNEX A.

30 The building up of the voice connection according to said RSVP protocol takes place in various set up stages, and is preceded by a contact-seeking stage outside RSVP. At the very first, the initiator 1 transmits an initiation message ALERT over the network 20 to the
called station 2. This is an "ordinary" message, transmitted in the
35 manner described with reference to Fig. 2, to inform the called station 2 of the fact that the initiator 1 is seeking contact. On the basis of this message, a signal can be generated at the called station 2, such as for example a telephone ringing signal.

CLAIMS

1. Method for establishing a connection (23; 43) suitable for communication in at least one direction between two subscriber stations (1; 2) in a communication network (20) comprising a plurality of switching stations or routers (21; 22; 42), in which a first subscriber station (1) and a second subscriber station (2) are connected with a predetermined router (21₁ and 21₂ respectively), and in which each router (21; 22; 42) can communicate with at least some of the other routers in the network;
in which said connection (23) runs via at least one of the said routers, each router (for example 22₂) being connected to a corresponding previous station or router (for example 22₁) and/or a corresponding next station or router (for example 22₃);
in which the first station (1) transmits a first message to the second station (2) via a first route (23) comprising at least one router (21₁), said first message containing first payment willingness information;
in which the second station (2), in response to the reception of the first message, transmits a second message back to the first station (1) via the said first route (23), the said second message containing second payment willingness information;
in which a router (for example 21₂) receiving the second message, if at least one of the first and the second payment willingness information entities has a predetermined value which is indicative of payment willingness, reserves at least a part of its communication capacity for direct connection with previous and following stations and/or routers (22₄; 2) related to said router (21₂).
2. Method according to Claim 1, in which a router (for example 21₂) receiving the second message, if at least one of the first and the second payment willingness information entities has a predetermined value indicative of payment willingness, also transmits the second message to the previous router or station (22₄) related to said router (21₂), which is repeated until said second message arrives at the first station (1).
3. Method according to Claim 1 or 2, in which the first station (1), in response to the reception of the second message, transmits a third message to the second station (2) via the said route (23).
4. Method according to Claim 1, 2 or 3, in which the said first

subscriber station (1) is the initiator of the connection (23) to be established and the said second subscriber station (2) is the called station, in which the first payment willingness information has a predetermined first value which is indicative of payment willingness and in which the second payment willingness information has a second value which is different from said predetermined first value.

5 5. Method according to Claim 1, 2 or 3, in which the said first subscriber station (1) is initiator of the connection (23) to be established and the said second subscriber station (2) is the called
10 station, and in which, in the case of "collect call", the second payment willingness information has a predetermined first value which is indicative of payment willingness and the first payment willingness information has a second value which is different from said predetermined first value.

15 6. Method according to Claim 1, 2 or 3, in which the said second subscriber station (2) is the initiator of the connection to be established and the said first station (1) is the called station, in which the second payment willingness information has a predetermined first value which is indicative of payment willingness and the first
20 payment willingness information has a second value which is different from the said predetermined first value.

7. Method according to Claim 1, 2 or 3, in which the said second subscriber station (2) is the initiator for the connection to be established and the said first subscriber station (1) is the called
25 station, in which, in the case of "collect call", the first payment willingness information has a predetermined first value which is indicative of payment willingness and the second payment willingness information has a second value which is different from said predetermined first value.

30 8. Router, suitable for inclusion in a network (20), comprising: at least two communication connections (101, 102); means (110) for establishing a connection between said communication connections (101, 102);
35 a control unit (103), coupled to the said communication connections, which is arranged for controlling said means (110);
a memory (104) coupled to the control unit (103);
in which the control unit (103), in response to the reception of a first message at one of said communication connections, is arranged

for storing in the said memory (104) data which is representative of the payment willingness information present in said first message, and for transmitting the first message to a following router via another communication connection;

5 in which the control unit (103), in response to the reception of a second message at the said other communication connection, is arranged, if at least one of the data stored in the said memory (104) and the payment willingness information present in the received second message has a value which is indicative of payment willingness, for
10 reserving at least a part of the capacity of the means (110) for a direct connection between said communication connections (102) and (101).

9. Router according to Claim 8, in which the control unit (103), in response to the reception of the second message at the said other
15 communication connection, is arranged, if at least one of the data stored in the said memory (104) and the payment willingness information present in the received second message has a value which is indicative of payment willingness, for transmitting the second message via the first-named communication connection (101) to the
20 previous router.

PATENT COOPERATION TREATY

From the INTERNATIONAL BUREAU

PCT

NOTIFICATION OF ELECTION

(PCT Rule 61.2)

To:

United States Patent and Trademark
Office
(Box PCT)
Crystal Plaza 2
Washington, DC 20231
ÉTATS-UNIS D'AMÉRIQUE

in its capacity as elected Office

Date of mailing (day/month/year) 29 July 1999 (29.07.99)	
International application No. PCT/EP98/07800	Applicant's or agent's file reference 402462WO
International filing date (day/month/year) 02 December 1998 (02.12.98)	Priority date (day/month/year) 05 December 1997 (05.12.97)
Applicant WENTINK, Maarten, Menzo et al	

1. The designated Office is hereby notified of its election made:

☒ in the demand filed with the International Preliminary Examining Authority on:
01 July 1999 (01.07.99)

☐ in a notice effecting later election filed with the International Bureau on:

2. The election ☒ was
☐ was not

made before the expiration of 19 months from the priority date or, where Rule 32 applies, within the time limit under Rule 32.2(b).

The International Bureau of WIPO 34, chemin des Colombettes 1211 Geneva 20, Switzerland	Authorized officer Céline Faust
Facsimile No.: (41-22) 740.14.35	Telephone No.: (41-22) 338.83.38

The demand must be filed directly with the competent International Preliminary Examining Authority or, if two or more Authorities are competent, with the one chosen by the applicant. The full name or two-letter code of that Authority may be indicated by the applicant on the line below:

IPEA/ EP

PCT

CHAPTER II

DEMAND

under Article 31 of the Patent Cooperation Treaty:

The undersigned requests that the international application specified below be the subject of international preliminary examination according to the Patent Cooperation Treaty and hereby elects all eligible States (except where otherwise indicated).

For International Preliminary Examining Authority use only

Identification of IPEA		Date of receipt of DEMAND	
Box No. I IDENTIFICATION OF THE INTERNATIONAL APPLICATION		Applicant's or agent's file reference 402462WO	
International application No. PCT/EP98/07800	International filing date (day/month/year) (02.12.98) 02 December 1998	(Earliest) Priority date (day/month/year) (05.12.97) 05 December 1997	
Title of invention METHOD AND DEVICE FOR CHARGING COMMUNICATIONS BASED ON RSVP PROTOCOL			
Box No. II APPLICANT(S)			
Name and address: (Family name followed by given name; for a legal entity, full official designation. The address must include postal code and name of country.) Koninklijke KPN N.V. 7 Stationsplein 9726 AE GRONINGEN The Netherlands		Telephone No.: +31 70 3323678	
		Facsimile No.: +31 70 3323840	
		Teleprinter No.:	
State (that is, country) of nationality: NL		State (that is, country) of residence: NL	
Name and address: (Family name followed by given name; for a legal entity, full official designation. The address must include postal code and name of country.) WENTINK, Maarten, Menzo Valkenboslaan 36 NL-2563 CL THE HAGUE The Netherlands			
State (that is, country) of nationality: NL		State (that is, country) of residence: NL	
Name and address: (Family name followed by given name; for a legal entity, full official designation. The address must include postal code and name of country.) VISSER, Michaël, Maria Anna van Hensbeeksingel 217 NL-2803 LT GOUDA The Netherlands			
State (that is, country) of nationality: NL		State (that is, country) of residence: NL	
<input type="checkbox"/> Further applicants are indicated on a continuation sheet.			

Box No. III AGENT OR COMMON REPRESENTATIVE; OR ADDRESS FOR CORRESPONDENCE

The following person is ☒ agent ☐ common representative

and ☒ has been appointed earlier and represents the applicant(s) also for international preliminary examination.

☐ is hereby appointed and any earlier appointment of (an) agent(s)/common representative is hereby revoked.

☐ is hereby appointed, specifically for the procedure before the International Preliminary Examining Authority, in addition to the agent(s)/common representative appointed earlier.

Name and address: *(Family name followed by given name; for a legal entity, full official designation. The address must include postal code and name of country.)*

KLEIN, Bart
Koninklijke KPN N.V.
P.O. Box 95321
NL-2509 CH THE HAGUE
The Netherlands

Telephone No.:

+31 70 3323091

Facsimile No.:

+31 70 3323840

Teleprinter No.:

☐ Address for correspondence: Mark this check-box where no agent or common representative is/has been appointed and the space above is used instead to indicate a special address to which correspondence should be sent.

Box No. IV BASIS FOR INTERNATIONAL PRELIMINARY EXAMINATION**Statement concerning amendments:***

1. The applicant wishes the international preliminary examination to start on the basis of:

☒ the international application as originally filed

the description ☒ as originally filed

☐ as amended under Article 34

the claims ☒ as originally filed

☐ as amended under Article 19 (together with any accompanying statement)

☐ as amended under Article 34

the drawings ☒ as originally filed

☐ as amended under Article 34

2. ☐ The applicant wishes any amendment to the claims under Article 19 to be considered as reversed.

3. ☐ The applicant wishes the start of the international preliminary examination to be postponed until the expiration of 20 months from the priority date unless the International Preliminary Examining Authority receives a copy of any amendments made under Article 19 or a notice from the applicant that he does not wish to make such amendments (Rule 69.1(d)). *(This check-box may be marked only where the time limit under Article 19 has not yet expired.)*

* Where no check-box is marked, international preliminary examination will start on the basis of the international application as originally filed or, where a copy of amendments to the claims under Article 19 and/or amendments of the international application under Article 34 are received by the International Preliminary Examining Authority before it has begun to draw up a written opinion or the international preliminary examination report, as so amended.

Language for the purposes of international preliminary examination: English

☒ which is the language in which the international application was filed.

☐ which is the language of a translation furnished for the purposes of international search.

☐ which is the language of publication of the international application.

☐ which is the language of the translation (to be) furnished for the purposes of international preliminary examination.

Box No. V ELECTION OF STATES

The applicant hereby elects all eligible States *(that is, all States which have been designated and which are bound by Chapter II of the PCT)*

excluding the following States which the applicant wishes not to elect:

Box No. VI CHECK LIST

The demand is accompanied by the following elements, in the language referred to in Box No. IV, for the purposes of international preliminary examination:

- | | | |
|--|---|--------|
| 1. translation of international application | : | sheets |
| 2. amendments under Article 34 | : | sheets |
| 3. copy (or, where required, translation) of amendments under Article 19 | : | sheets |
| 4. copy (or, where required, translation) of statement under Article 19 | : | sheets |
| 5. letter | : | sheets |
| 6. other (specify) | : | sheets |

For International Preliminary Examining Authority use only

received not received

<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/>	<input type="checkbox"/>

The demand is also accompanied by the item(s) marked below:

- | | |
|--|---|
| 1. <input checked="" type="checkbox"/> fee calculation sheet | 4. <input type="checkbox"/> statement explaining lack of signature |
| 2. <input type="checkbox"/> separate signed power of attorney | 5. <input type="checkbox"/> nucleotide and or amino acid sequence listing in computer readable form |
| 3. <input checked="" type="checkbox"/> copy of general power of attorney; reference number, if any: GA 21396 | 6. <input type="checkbox"/> other (specify): |

Box No. VII SIGNATURE OF APPLICANT, AGENT OR COMMON REPRESENTATIVE

Next to each signature, indicate the name of the person signing and the capacity in which the person signs (if such capacity is not obvious from reading the demand).


Bart KLEIN

For International Preliminary Examining Authority use only

1. Date of actual receipt of DEMAND:

2. Adjusted date of receipt of demand due to CORRECTIONS under Rule 60.1(b):

3. ☐ The date of receipt of the demand is AFTER the expiration of 19 months from the priority date and item 4 or 5, below, does not apply.

☐ The applicant has been informed accordingly.

4. ☐ The date of receipt of the demand is WITHIN the period of 19 months from the priority date as extended by virtue of Rule 80.5.

5. ☐ Although the date of receipt of the demand is after the expiration of 19 months from the priority date, the delay in arrival is EXCUSED pursuant to Rule 82.

For International Bureau use only

Demand received from IPEA on:

PCT

FEE CALCULATION SHEET

Annex to the Demand for international preliminary examination

For International Preliminary Examining Authority use only

International
application No. PCT/EP98/07800Applicant's or agent's
file reference 402462WO

Date stamp of the IPEA

Applicant


Koninklijke KPN N.V.

Calculation of prescribed fees

1. Preliminary examination fee EUR 1533 ☐ P
2. Handling fee (*Applicants from certain States are entitled to a reduction of 75% of the handling fee. Where the applicant is (or all applicants are) so entitled, the amount to be entered at H is 25% of the handling fee.*) EUR 148 ☐ H
3. Total of prescribed fees
Add the amounts entered at P and H
and enter total in the TOTAL box EUR 1681
TOTAL

Mode of Payment

- ☒ authorization to charge deposit
account with the IPEA (see below) ☐ cash
- ☐ cheque ☐ revenue stamps
- ☐ postal money order ☐ coupons
- ☐ bank draft ☐ other (specify):

Deposit Account Authorization (*this mode of payment may not be available at all IPEAs*)The IPEA/ EP ☒ is hereby authorized to charge the total fees indicated above to my deposit account.☒ (*this check-box may be marked only if the conditions for deposit accounts of the IPEA so permit*) is hereby authorized to charge any deficiency or credit any overpayment in the total fees indicated above to my deposit account.28090011
Deposit Account Number30 June 1999
Date (day/month/year)
Signature Bart KLEIN

PATENT COOPERATION TREATY

KPN N.V.

From the
INTERNATIONAL PRELIMINARY EXAMINING AUTHORITY

PCT

To:

Klein, B.
KONINKLIJKE KPN N.V.
P.O. Box 95321
NL-2509 CH Den Haag
PAYS-BAS

NOTIFICATION OF TRANSMITTAL OF THE INTERNATIONAL PRELIMINARY EXAMINATION REPORT (PCT Rule 71.1)

Date of mailing (day/month/year)	24.03.2000
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Applicant's or agent's file reference 402462WO	IMPORTANT NOTIFICATION
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International application No. PCT/EP98/07800	International filing date (day/month/year) 02/12/1998	Priority date (day/month/year) 05/12/1997
---	--	--

Applicant KONINKLIJKE KPN N.V. et al.
--

1. The applicant is hereby notified that this International Preliminary Examining Authority transmits herewith the international preliminary examination report and its annexes, if any, established on the international application.
2. A copy of the report and its annexes, if any, is being transmitted to the International Bureau for communication to all the elected Offices.
3. Where required by any of the elected Offices, the International Bureau will prepare an English translation of the report (but not of any annexes) and will transmit such translation to those Offices.

4. REMINDER

The applicant must enter the national phase before each elected Office by performing certain acts (filing translations and paying national fees) within 30 months from the priority date (or later in some Offices) (Article 39(1)) (see also the reminder sent by the International Bureau with Form PCT/IB/301).

Where a translation of the international application must be furnished to an elected Office, that translation must contain a translation of any annexes to the international preliminary examination report. It is the applicant's responsibility to prepare and furnish such translation directly to each elected Office concerned.

For further details on the applicable time limits and requirements of the elected Offices, see Volume II of the PCT Applicant's Guide.

Name and mailing address of the IPEA/	Authorized officer
---------------------------------------	--------------------



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PATENT COOPERATION TREATY

PCT

INTERNATIONAL PRELIMINARY EXAMINATION REPORT

(PCT Article 36 and Rule 70)

Applicant's or agent's file reference 402462WO	FOR FURTHER ACTION See Notification of Transmittal of International Preliminary Examination Report (Form PCT/IPEA/416)	
International application No. PCT/EP98/07800	International filing date (day/month/year) 02/12/1998	Priority date (day/month/year) 05/12/1997
International Patent Classification (IPC) or national classification and IPC H04M7/00		
Applicant KONINKLIJKE KPN N.V. et al.		



1. This international preliminary examination report has been prepared by this International Preliminary Examining Authority and is transmitted to the applicant according to Article 36.
2. This REPORT consists of a total of 5 sheets, including this cover sheet.

☒ This report is also accompanied by ANNEXES, i.e. sheets of the description, claims and/or drawings which have been amended and are the basis for this report and/or sheets containing rectifications made before this Authority (see Rule 70.16 and Section 607 of the Administrative Instructions under the PCT).

 These annexes consist of a total of 6 sheets.

3. This report contains indications relating to the following items:

- I ☒ Basis of the report
- II ☐ Priority
- III ☐ Non-establishment of opinion with regard to novelty, inventive step and industrial applicability
- IV ☐ Lack of unity of invention
- V ☒ Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement
- VI ☒ Certain documents cited
- VII ☐ Certain defects in the International application
- VIII ☐ Certain observations on the international application

Date of submission of the demand 01/07/1999	Date of completion of this report 24.03.2000
Name and mailing address of the international preliminary examining authority:  European Patent Office D-80298 Munich Tel. +49 89 2399 - 0 Tx: 523656 epmu d Fax: +49 89 2399 - 4465	Authorized officer Dominguez, I Telephone No. +49 89 2399 2232 

**INTERNATIONAL PRELIMINARY
EXAMINATION REPORT**

International application No. PCT/EP98/07800

I. Basis of the report

1. This report has been drawn on the basis of (*substitute sheets which have been furnished to the receiving Office in response to an invitation under Article 14 are referred to in this report as "originally filed" and are not annexed to the report since they do not contain amendments.*):

Description, pages:

1,3-5,7-14 as originally filed

2,2a,6 as received on 05/02/2000 with letter of 03/02/2000

Claims, No.:

1-9 as received on 05/02/2000 with letter of 03/02/2000

Drawings, sheets:

1/3-3/3 as originally filed

2. The amendments have resulted in the cancellation of:

☐ the description, pages:

☐ the claims, Nos.:

☐ the drawings, sheets:

3. ☐ This report has been established as if (some of) the amendments had not been made, since they have been considered to go beyond the disclosure as filed (Rule 70.2(c)):

4. Additional observations, if necessary:

**INTERNATIONAL PRELIMINARY
EXAMINATION REPORT**

International application No. PCT/EP98/07800

V. Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

1. Statement

Novelty (N)	Yes:	Claims	1-9
	No:	Claims	NONE
Inventive step (IS)	Yes:	Claims	1-9
	No:	Claims	NONE
Industrial applicability (IA)	Yes:	Claims	1-9
	No:	Claims	NONE

2. Citations and explanations

see separate sheet

VI. Certain documents cited

1. Certain published documents (Rule 70.10)

and / or

2. Non-written disclosures (Rule 70.9)

see separate sheet

Concerning section V (reasoned statement under Article 35(2))

1. The application concerns a method and device for communication, in particular a method for establishing a connection between two subscriber stations in a communication network comprising a plurality of switching stations or routers, and a router suitable to carry out said method.

More in particular, the application addresses the problem of establishing voice communication over a network such as internet, by using the Resource Reservation Protocol (RSVP), wherein capacity is reserved for the communication as soon as one of the parties indicates its willingness to pay for it.

2. All of the documents cited in the International Search Report deal with the problem of establishing a voice connection over a data network and billing for this connection. For example, WO-97-37462 describes a communication network which includes a communication monitoring point arranged to monitor user identifiers to determine the charging scheme.

However, none of these documents (except for the document mentioned in section VI below) uses the above mentioned RSVP to establish the voice connections over the data network, and they are, therefore, not concerned with the problem that this application intends to solve.

Indeed, the currently known RSVP protocol has the disadvantage of not providing facilities for having at least one of the users pay for the established connection. This leads not only to economical problems (since it is difficult for the administrators of the routers to charge for their services), but also to efficiency problems, since users would tend to shorten the reservation if they have to pay for it.

3. The method and device proposed in the application solve these problems by adding a code in some of the messages used to set up the RSVP connection, which is indicative of the degree in which the sender of said message is willing to bear the costs of the reservation. In this way, the routers on the path from one station to the others know exactly if any of the two parties wishes to pay, and which, and take this information into account upon taking a decision with respect to the assignment of the requested

**INTERNATIONAL PRELIMINARY
EXAMINATION REPORT - SEPARATE SHEET**

International application No. PCT/EP98/07800

reservation, i.e. each router is set up to assign the requested reservation only if at least one of the parties has expressed willingness to bear the costs.

4. None of the available prior art documents gives any indication that would lead a person skilled in the art to the solution proposed in the application.
5. It is therefore considered that independent claims 1 and 8 meet the requirements of Articles 33(2), (3) and (4) PCT regarding novelty, inventive step and industrial applicability.
6. Claims 2 to 7 and 9 contain further details of the method and router of claims 1 and 8, respectively. As they are dependent on these claims, they also meet the requirements of Articles 33 (2), (3) and (4) PCT regarding novelty, inventive step and industrial applicability.

Concerning section VI (certain documents cited)

The priority document pertaining to the present application was not available at the time of establishing this first written opinion. Hence, it is based on the assumption that all claims enjoy priority rights from the filing date of the priority document. If it later turns out that this is not correct, the document by Karsten et al. cited in the International Search Report could become relevant to assess whether the claims satisfy the criteria set forth in Article 33 (1) PCT.

2 (replacement page)

A need exists to use the internet (or similar networks) for voice communication. This implies that a real "connection" must be established between two stations and that provisions must be made to ensure that the various parts of the (digitised) message arrive at
5 their destination within a fixed time, for example 100 ms. To this end a protocol is currently under development, called "Resource Reservation Protocol" (RSVP). By means of this protocol, certain nodes or intermediate stations of the network, referred to below as "routers", are, stating it briefly, instructed to maintain a certain
10 connection: a certain amount of processing capacity of the related routers is, as it were, "reserved".

Although the currently known protocol in itself is quite satisfactory for establishing a connection, it has the disadvantage of not providing facilities for having at least one of the users pay for
15 the established reservation. It is not only particularly useful, from an economic point of view, for the various administrators of the various routers to be able to have at least one of the users pay for the provision of the said service (reservation), but this also has the advantage that the users will only request and maintain the
20 reservation for the duration of the call. If the reservation were "free", it would not be inconceivable that a user continues a given reservation even if it is not used, thus unnecessarily burdening the capacity of the network. If the users have to pay for the reservation, they will sooner tend to cancel the reservation when it is no longer
25 required, so that in fact the capacity of the network for establishing voice communication can be used as efficiently as possible.

A problem which plays a role in this regard is the question who must pay for the connection. In principal this will be the initiator of the connection, but, in an internet or similar network, where a
30 connection is established on the basis of the currently known RSVP protocol, it is not known, in contrast to telephone networks, who the initiator is, as will be discussed in more detail below.

The present invention seeks to provide a solution for this problem.

35 It is observed that accounting systems as such for networks are already known ,e.g. from WO97/37462. This International patent application teaches a communication network, which comprises a communication monitoring point arranged to monitor user identifiers in

AMENDED SHEET

2a (replacement page)

packets to determine a charging scheme. which includes charge allocation.

5 More in particular, the present invention seeks to provide a protocol which makes it possible that, upon the establishment of the connection, the initiator of the connection can be identified, or that at any rate it can be identified which of the two parties is willing

to Fig. 3. In Fig. 3, reference numbers which are the same as in the figures 1 and 2 designate the same or similar parts.

It is again assumed that the first subscriber 1 wishes to establish a connection with the second subscriber 2, and indeed a
 5 connection of which the quality is suitable for the transfer of speech. Below, said first subscriber 1 will also be designated by the term "initiator", and the second subscriber 2 will also be designated by the term "called party". For the sake of convenience, it is further assumed that said voice connection follows the route 23 referred to
 10 above. The requirement that the connection 23 must have a quality suitable for speech, implies that all the intermediate stations or routers 21₁, 22₁ to 22₄ (inclusive), 21₂, which are located along said route 23, must maintain the connection with a predecessor and a successor, or, in other words, must reserve part of their capacity for
 15 this connection. This is designated as "Resource Reservation", and a protocol developed to this end is designated as "Resource Reservation Protocol" (RSVP). This known protocol was developed primarily for establishing a connection with a predetermined quality between two stations 1 and 2, in which the second station 2 is a source of
 20 information and the first station 1 wishes to receive information from said source 2.

Since said protocol is already known by those skilled in the art, an extensive description of this is not necessary.

The building up of the voice connection according to said RSVP
 25 protocol takes place in various set up stages, and is preceded by a contact-seeking stage outside RSVP. At the very first, the initiator 1 transmits an initiation message ALERT over the network 20 to the called station 2. This is an "ordinary" message, transmitted in the manner described with reference to Fig. 2, to inform the called
 30 station 2 of the fact that the initiator 1 is seeking contact. On the basis of this message, a signal can be generated at the called station 2, such as for example a telephone ringing signal.

Amended claims

1. Method for establishing a connection (23; 43) suitable for
5 communication in at least one direction between two subscriber
stations (1; 2) in a communication network (20) comprising a plurality
of switching stations or routers (21; 22; 42), in which a first
subscriber station (1) and a second subscriber station (2) are
connected with a predetermined router (21₁ and 21₂ respectively), and
10 in which each router (21; 22; 42) can communicate with at least one of
the other routers in the network,
in which said connection (23) runs via at least one of the said
routers, each router (for example 22₂) being connected to a
corresponding previous station or router (for example 22₁) and/or a
15 corresponding next station or router (for example 22₃),
characterized in that
the first station (1) transmits a first message to the second station
(2) via a first route (23) comprising at least one router (21₁), said
first message containing first payment willingness information,
20 in which the second station (2), in response to the reception of the
first message, transmits a second message back to the first station
(1) via the said first route (23), the said second message containing
second payment willingness information,
and in that
25 a router (for example 21₂) receiving the second message, if at least
one of the first and the second payment willingness information
entities has a predetermined value which is indicative of payment
willingness, reserves at least a part of its communication capacity
for direct connection with previous and following stations and/or
30 routers (22₄; 2) related to said router (21₂).
2. Method according to Claim 1, in which a router (for example 21₂)
receiving the second message, if at least one of the first and the
second payment willingness information entities has a predetermined
value indicative of payment willingness, also transmits the second
35 message to the previous router or station (22₄) related to said router
(21₂), which is repeated until said second message arrives at the first
station (1).
3. Method according to Claim 1 or 2, in which the first station
(1), in response to the reception of the second message, transmits a
40 third message to the second station (2) via the said route (23).

4. Method according to Claim 1, 2 or 3, in which the said first subscriber station (1) is the initiator of the connection (23) to be established and the said second subscriber station (2) is the called station, in which the first payment willingness information has a
5 predetermined first value which is indicative of payment willingness and in which the second payment willingness information has a second value which is different from said predetermined first value.
5. Method according to Claim 1, 2 or 3, in which the said first subscriber station (1) is initiator of the connection (23) to be
10 established and the said second subscriber station (2) is the called station, and in which, in the case of "collect call", the second payment willingness information has a predetermined first value which is indicative of payment willingness and the first payment willingness information has a second value which is different from said
15 predetermined first value.
6. Method according to Claim 1, 2 or 3, in which the said second subscriber station (2) is the initiator of the connection to be established and the said first station (1) is the called station, in which the second payment willingness information has a predetermined
20 first value which is indicative of payment willingness and the first payment willingness information has a second value which is different from the said predetermined first value.
7. Method according to Claim 1, 2 or 3, in which the said second subscriber station (2) is the initiator for the connection to be
25 established and the said first subscriber station (1) is the called station, in which, in the case of "collect call", the first payment willingness information has a predetermined first value which is indicative of payment willingness and the second payment willingness information has a second value which is different from said
30 predetermined first value.
8. Router, suitable for inclusion in a network (20), comprising:
at least two communication connections (101, 102),
means (110) for establishing a connection between said communication connections (101, 102),
35 a control unit (103), coupled to the said communication connections, which is arranged for controlling said means (110),
a memory (104) coupled to the control unit (103),
characterized in that
the control unit (103), in response to the reception of a first
40 message at one of said communication connections, is arranged for

storing in the said memory (104) data which is representative of the payment willingness information present in said first message, and for transmitting the first message to a following router via another communication connection,

5 and in that

the control unit (103), in response to the reception of a second message at the said other communication connection, is arranged, if at least one of the data stored in the said memory (104) and the payment willingness information present in the received second message has a value which is indicative of payment willingness, for reserving at least a part of the capacity of the means (110) for a direct connection between said communication connections (102) and (101).

9. Router according to Claim 8, in which the control unit (103), in response to the reception of the second message at the said other communication connection, is arranged, if at least one of the data stored in the said memory (104) and the payment willingness information present in the received second message has a value which is indicative of payment willingness, for transmitting the second message via the first-named communication connection (101) to the previous router.

PATENT COOPERATION TREATY

From the RECEIVING OFFICE

PCT

To:

Klein, Bart
KONINKLIJKE KPN N.V.
P.O. Box 95321
2509 CH Den Haag
PAYS-BAS

NOTIFICATION OF THE INTERNATIONAL
APPLICATION NUMBER AND OF THE
INTERNATIONAL FILING DATE

(PCT Rule 20.5(c))

Date of mailing
(day/month/year)

28 JAN 1999

Applicant's or agent's file reference
402462WO

IMPORTANT NOTIFICATION

International application No.
PCT/EP 98/07800

International filing date (day/month/year)
02/12/1998

Priority date (day/month/year)
05/12/1997

Applicant
KONINKLIJKE KPN N.V.

Title of the invention

1. The applicant is hereby notified that the international application has been accorded the international application number and the international filing date indicated above.
2. The applicant is further notified that the record copy of the international application was transmitted to the International Bureau on the above date of mailing.
3. ☐ Other:

* The International Bureau monitors the transmittal of the record copy by the receiving Office and will notify the applicant (with Form PCT/IB/301) of its receipt. Should the record copy not have been received by the expiration of 14 months from the priority date, the International Bureau will notify the applicant (Rule 22.1(c)).

Name and mailing address of the receiving Office



European Patent Office, P.B. 5818 Patentlaan 2
NL-2280 HV Rijswijk
Tel. (+31-70) 340-2040, Tx. 31 651 epo nl,
Fax: (+31-70) 340-3016

Authorized officer

C.A.J.A. PASCHE

PATENT COOPERATION TREATY

From the RECEIVING OFFICE

PCT

To:

Klein, Bart
KONINKLIJKE KPN N.V.
P.O. Box 95321
2509 CH Den Haag
PAYS-BAS

COMMUNICATION IN CASES FOR WHICH
NO OTHER FORM IS APPLICABLE

Date of mailing (day/month/year)	28 JAN 1999
Applicant's or agent's file reference 402462WO	REPLY DUE See paragraph 1 below
International application No. PCT/ EP 98/ 07800	International filing date (day/month/year) 02/12/1998
Applicant KONINKLIJKE KPN N.V.	



1. ☐ REPLY DUE within _____ months/days from the above date of mailing

☐ NO REPLY DUE, however see below _____

☐ IMPORTANT COMMUNICATION

☒ INFORMATION ONLY

2. COMMUNICATION : *see enclosed continuation.*

Name and mailing address of the receiving Office  European Patent Office, P.B. 5818 Patentlaan 2 NL-2280 HV Rijswijk Tel. (+31-70) 340-2040, Tx. 31 651 epo nl, Fax: (+31-70) 340-3016	Authorized officer <div style="text-align: right;">  C. A. A. PASCHE </div>
---	---

Communication in cases for which no other form is applicable

International application No.

PCT/EP 98 / 07800

Purported designation of Guinea-Bissau (GW) for a national patent

1. On 08 May 1998 (08.05.98), Guinea-Bissau became a member State of the African Intellectual Property Organization (OAPI) and as from that date, it is possible for PCT applicants to designate Guinea-Bissau for an OAPI patent. Furthermore, as from 08 July 1998 (08.07.98), it is no longer possible to designate Guinea-Bissau for a national patent, but rather, any designation of Guinea-Bissau in an international application filed on or after 08 July 1998 (08.07.98) will have the effect of an indication of the wish to obtain an OAPI patent.

Because the designation for an OAPI patent of any State which is party both to the PCT and to the OAPI Agreement automatically has the effect of a designation of all such States for an OAPI patent; it is not possible to make a designation for an OAPI patent of only some of those States. Thus, the designation of Guinea-Bissau for an OAPI patent in fact results in the designation of all OAPI states for an OAPI patent.

Therefore, as explained above,

- ☒ the purported designation of Guinea-Bissau for a national patent has been cancelled *ex officio* by this receiving Office, and
 - ☒ the designation "OA" made by the applicant includes automatically "GW Guinea-Bissau" in the list of States covered by the designation "OA".
 - ☐ the designation "OA", which was not made by the applicant, has been added by this receiving Office by marking the check-box "OA".

2. Where the record copy of the international application has already been transmitted to the International Bureau a copy of this communication is being sent to the International Bureau.

Name and mailing address of the receiving Office

European Patent Office, P.B. 5818 Patentlaan 2
NL-2280 HV Rijswijk
Tel. (+31-70) 340-2040, Tx. 31 651 epo nl,
Fax: (+31-70) 340-3016

PCT**REQUEST**

The undersigned requests that the present international application be processed according to the Patent Cooperation Treaty.

For Receiving Office use only

PCT/EP 98 / 07800

International Application No.

02 DEC 1998**(02.12.1998)**

International Filing Date

EUROPEAN PATENT OFFICE**PCT INTERNATIONAL APPLICATION**

Name of receiving Office and "PCT International Application"

Applicant's or agent's file reference
(if desired) (12 characters maximum) **402462WO****Box No. I TITLE OF INVENTION****Method and device for communication****Box No. II APPLICANT**

Name and address: (Family name followed by given name; for a legal entity, full official designation. The address must include postal code and name of country. The country of the address indicated in this Box is the applicant's State (that is, country) of residence if no State of residence is indicated below.)

KONINKLIJKE KPN N.V.
Stationsplein 7
9726 AE GRONINGEN
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☐ This person is also inventor.Telephone No.
+31 70 3323091Facsimile No.
++31 70 3323840

Teleprinter No.

State (that is, country) of nationality:

NL

State (that is, country) of residence:

NLThis person is applicant
for the purposes of:☐all designated
States☒all designated States except
the United States of America☐the United States
of America only☐the States indicated in
the Supplemental Box**Box No. III FURTHER APPLICANT(S) AND/OR (FURTHER) INVENTOR(S)**

Name and address: (Family name followed by given name; for a legal entity, full official designation. The address must include postal code and name of country. The country of the address indicated in this Box is the applicant's State (that is, country) of residence if no State of residence is indicated below.)

WENTINK Maarten Menzo
Valkenboslaan 36
2563 CL THE HAGUE
The Netherlands

This person is:

☐ applicant only☒ applicant and inventor☐ inventor only (If this check-box
is marked, do not fill in below.)

State (that is, country) of nationality:

NL

State (that is, country) of residence:

NLThis person is applicant
for the purposes of:☐all designated
States☐all designated States except
the United States of America☒the United States
of America only☐the States indicated in
the Supplemental Box☒ Further applicants and/or (further) inventors are indicated on a continuation sheet.**Box No. IV AGENT OR COMMON REPRESENTATIVE; OR ADDRESS FOR CORRESPONDENCE**The person identified below is hereby/has been appointed to act on behalf
of the applicant(s) before the competent International Authorities as:☒

agent

☐

common representative

Name and address: (Family name followed by given name; for a legal entity, full official designation. The address must include postal code and name of country.)

KLEIN Bart
KONINKLIJKE KPN N.V.
P.O. Box 95321
2509 CH THE HAGUE
The Netherlands

Telephone No.

+31 70 3323091

Facsimile No.

+31 70 3323840

Teleprinter No.

☐ **Address for correspondence:** Mark this check-box where no agent or common representative is/has been appointed and the space above is used instead to indicate a special address to which correspondence should be sent.

Continuation of Box No. III FURTHER APPLICANT(S) AND/OR (FURTHER) INVENTOR(S)	
<i>If none of the following sub-boxes is used, this sheet should not be included in the request.</i>	
<p>Name and address: (Family name followed by given name; for a legal entity, full official designation. The address must include postal code and name of country. The country of the address indicated in this Box is the applicant's State (that is, country) of residence if no State of residence is indicated below.)</p> <p>VISSER Michaël Maria Anna van Hensbeeksingel 217 2803 LT GOUDA The Netherlands</p>	<p>This person is:</p> <p><input type="checkbox"/> applicant only</p> <p><input checked="" type="checkbox"/> applicant and inventor</p> <p><input type="checkbox"/> inventor only (If this check-box is marked, do not fill in below.)</p>
State (that is, country) of nationality: NL	State (that is, country) of residence: NL
<p>This person is applicant for the purposes of:</p> <p><input type="checkbox"/> all designated States <input type="checkbox"/> all designated States except the United States of America <input checked="" type="checkbox"/> the United States of America only <input type="checkbox"/> the States indicated in the Supplemental Box</p>	
<p>Name and address: (Family name followed by given name; for a legal entity, full official designation. The address must include postal code and name of country. The country of the address indicated in this Box is the applicant's State (that is, country) of residence if no State of residence is indicated below.)</p>	<p>This person is:</p> <p><input type="checkbox"/> applicant only</p> <p><input type="checkbox"/> applicant and inventor</p> <p><input type="checkbox"/> inventor only (If this check-box is marked, do not fill in below.)</p>
State (that is, country) of nationality:	State (that is, country) of residence:
<p>This person is applicant for the purposes of:</p> <p><input type="checkbox"/> all designated States <input type="checkbox"/> all designated States except the United States of America <input type="checkbox"/> the United States of America only <input type="checkbox"/> the States indicated in the Supplemental Box</p>	
<p>Name and address: (Family name followed by given name; for a legal entity, full official designation. The address must include postal code and name of country. The country of the address indicated in this Box is the applicant's State (that is, country) of residence if no State of residence is indicated below.)</p>	<p>This person is:</p> <p><input type="checkbox"/> applicant only</p> <p><input type="checkbox"/> applicant and inventor</p> <p><input type="checkbox"/> inventor only (If this check-box is marked, do not fill in below.)</p>
State (that is, country) of nationality:	State (that is, country) of residence:
<p>This person is applicant for the purposes of:</p> <p><input type="checkbox"/> all designated States <input type="checkbox"/> all designated States except the United States of America <input type="checkbox"/> the United States of America only <input type="checkbox"/> the States indicated in the Supplemental Box</p>	
<p>Name and address: (Family name followed by given name; for a legal entity, full official designation. The address must include postal code and name of country. The country of the address indicated in this Box is the applicant's State (that is, country) of residence if no State of residence is indicated below.)</p>	<p>This person is:</p> <p><input type="checkbox"/> applicant only</p> <p><input type="checkbox"/> applicant and inventor</p> <p><input type="checkbox"/> inventor only (If this check-box is marked, do not fill in below.)</p>
State (that is, country) of nationality:	State (that is, country) of residence:
<p>This person is applicant for the purposes of:</p> <p><input type="checkbox"/> all designated States <input type="checkbox"/> all designated States except the United States of America <input type="checkbox"/> the United States of America only <input type="checkbox"/> the States indicated in the Supplemental Box</p>	
<p>Name and address: (Family name followed by given name; for a legal entity, full official designation. The address must include postal code and name of country. The country of the address indicated in this Box is the applicant's State (that is, country) of residence if no State of residence is indicated below.)</p>	<p>This person is:</p> <p><input type="checkbox"/> applicant only</p> <p><input type="checkbox"/> applicant and inventor</p> <p><input type="checkbox"/> inventor only (If this check-box is marked, do not fill in below.)</p>
State (that is, country) of nationality:	State (that is, country) of residence:
<p>This person is applicant for the purposes of:</p> <p><input type="checkbox"/> all designated States <input type="checkbox"/> all designated States except the United States of America <input type="checkbox"/> the United States of America only <input type="checkbox"/> the States indicated in the Supplemental Box</p>	
<p><input type="checkbox"/> Further applicants and/or (further) inventors are indicated on another continuation sheet.</p>	

Box No.V DESIGNATION OF STATES

The following designations are hereby made under Rule 4.9(a) (mark the applicable check-boxes: at least one must be marked):

Regional Patent

- ☒ **AP ARIPO Patent:** GH Ghana, GM Gambia, KE Kenya, LS Lesotho, MW Malawi, SD Sudan, SZ Swaziland, UG Uganda, ZW Zimbabwe, and any other State which is a Contracting State of the Harare Protocol and of the PCT
- ☒ **EA Eurasian Patent:** AM Armenia, AZ Azerbaijan, BY Belarus, KG Kyrgyzstan, KZ Kazakhstan, MD Republic of Moldova, RU Russian Federation, TJ Tajikistan, TM Turkmenistan, and any other State which is a Contracting State of the Eurasian Patent Convention and of the PCT
- ☒ **EP European Patent:** AT Austria, BE Belgium, CH and LI Switzerland and Liechtenstein, CY Cyprus, DE Germany, DK Denmark, ES Spain, FI Finland, FR France, GB United Kingdom, GR Greece, IE Ireland, IT Italy, LU Luxembourg, MC Monaco, NL Netherlands, PT Portugal, SE Sweden, and any other State which is a Contracting State of the European Patent Convention and of the PCT
- ☒ **OA OAPI Patent:** BF Burkina Faso, BJ Benin, CF Central African Republic, CG Congo, CI Côte d'Ivoire, CM Cameroon, GA Gabon, GN Guinea, ML Mali, MR Mauritania, NE Niger, SN Senegal, TD Chad, TG Togo, and any other State which is a member State of OAPI and a Contracting State of the PCT (if other kind of protection or treatment desired, specify on dotted line)

National Patent (if other kind of protection or treatment desired, specify on dotted line):

- | | |
|--|--|
| <input checked="" type="checkbox"/> AL Albania | <input checked="" type="checkbox"/> LS Lesotho |
| <input checked="" type="checkbox"/> AM Armenia | <input checked="" type="checkbox"/> LT Lithuania |
| <input checked="" type="checkbox"/> AT Austria | <input checked="" type="checkbox"/> LU Luxembourg |
| <input checked="" type="checkbox"/> AU Australia | <input checked="" type="checkbox"/> LV Latvia |
| <input checked="" type="checkbox"/> AZ Azerbaijan | <input checked="" type="checkbox"/> MD Republic of Moldova |
| <input checked="" type="checkbox"/> BA Bosnia and Herzegovina | <input checked="" type="checkbox"/> MG Madagascar |
| <input checked="" type="checkbox"/> BB Barbados | <input checked="" type="checkbox"/> MK The former Yugoslav Republic of Macedonia |
| <input checked="" type="checkbox"/> BG Bulgaria | |
| <input checked="" type="checkbox"/> BR Brazil | <input checked="" type="checkbox"/> MN Mongolia |
| <input checked="" type="checkbox"/> BY Belarus | <input checked="" type="checkbox"/> MW Malawi |
| <input checked="" type="checkbox"/> CA Canada | <input checked="" type="checkbox"/> MX Mexico |
| <input checked="" type="checkbox"/> CH and LI Switzerland and Liechtenstein | <input checked="" type="checkbox"/> NO Norway |
| <input checked="" type="checkbox"/> CN China | <input checked="" type="checkbox"/> NZ New Zealand |
| <input checked="" type="checkbox"/> CU Cuba | <input checked="" type="checkbox"/> PL Poland |
| <input checked="" type="checkbox"/> CZ Czech Republic | <input checked="" type="checkbox"/> PT Portugal |
| <input checked="" type="checkbox"/> DE Germany | <input checked="" type="checkbox"/> RO Romania |
| <input checked="" type="checkbox"/> DK Denmark | <input checked="" type="checkbox"/> RU Russian Federation |
| <input checked="" type="checkbox"/> EE Estonia | <input checked="" type="checkbox"/> SD Sudan |
| <input checked="" type="checkbox"/> ES Spain | <input checked="" type="checkbox"/> SE Sweden |
| <input checked="" type="checkbox"/> FI Finland | <input checked="" type="checkbox"/> SG Singapore |
| <input checked="" type="checkbox"/> GB United Kingdom | <input checked="" type="checkbox"/> SI Slovenia |
| <input checked="" type="checkbox"/> GE Georgia | <input checked="" type="checkbox"/> SK Slovakia |
| <input checked="" type="checkbox"/> GH Ghana | <input checked="" type="checkbox"/> SL Sierra Leone |
| <input checked="" type="checkbox"/> GM Gambia | <input checked="" type="checkbox"/> TJ Tajikistan |
| <input checked="" type="checkbox"/> GW Guinea-Bissau | <input checked="" type="checkbox"/> TM Turkmenistan |
| <input checked="" type="checkbox"/> HR Croatia | <input checked="" type="checkbox"/> TR Turkey |
| <input checked="" type="checkbox"/> HU Hungary | <input checked="" type="checkbox"/> TT Trinidad and Tobago |
| <input checked="" type="checkbox"/> ID Indonesia | <input checked="" type="checkbox"/> UA Ukraine |
| <input checked="" type="checkbox"/> IL Israel | <input checked="" type="checkbox"/> UG Uganda |
| <input checked="" type="checkbox"/> IS Iceland | <input checked="" type="checkbox"/> US United States of America |
| <input checked="" type="checkbox"/> JP Japan | |
| <input checked="" type="checkbox"/> KE Kenya | <input checked="" type="checkbox"/> UZ Uzbekistan |
| <input checked="" type="checkbox"/> KG Kyrgyzstan | <input checked="" type="checkbox"/> VN Viet Nam |
| <input checked="" type="checkbox"/> KP Democratic People's Republic of Korea | <input checked="" type="checkbox"/> YU Yugoslavia |
| | <input checked="" type="checkbox"/> ZW Zimbabwe |
| <input checked="" type="checkbox"/> KR Republic of Korea | |
| <input checked="" type="checkbox"/> KZ Kazakhstan | Check-boxes reserved for designating States (for the purposes of a national patent) which have become party to the PCT after issuance of this sheet: |
| <input checked="" type="checkbox"/> LC Saint Lucia | <input type="checkbox"/> |
| <input checked="" type="checkbox"/> LK Sri Lanka | <input type="checkbox"/> |
| <input checked="" type="checkbox"/> LR Liberia | |

Precautionary Designation Statement: In addition to the designations made above, the applicant also makes under Rule 4.9(b) all other designations which would be permitted under the PCT except any designation(s) indicated in the Supplemental Box as being excluded from the scope of this statement. The applicant declares that those additional designations are subject to confirmation and that any designation which is not confirmed before the expiration of 15 months from the priority date is to be regarded as withdrawn by the applicant at the expiration of that time limit. (Confirmation of a designation consists of the filing of a notice specifying that designation and the payment of the designation and confirmation fees. Confirmation must reach the receiving Office within the 15-month time limit.)

Box No. VI PRIORITY CLAIM		<input type="checkbox"/> Further priority claim indicated in the Supplemental Box.		
Filing date of earlier application (day/month/year)	Number of earlier application	Where earlier application is:		
		national application: country	regional application: regional Office	international application: receiving Office
item (1) (05 DEC 97) 05/12/97	1007702	NL		
item (2)				
item (3)				

☐ The receiving Office is requested to prepare and transmit to the International Bureau a certified copy of the earlier application(s) (only if the earlier application was filed with the Office which for the purposes of the present international application is the receiving Office) identified above as item(s):

* Where the earlier application is an ARIPO application, it is mandatory to indicate in the Supplemental Box at least one country party to the Paris Convention for the Protection of Industrial Property for which that earlier application was filed (Rule 4.10(b)(ii)). See Supplemental Box.

Box No. VII INTERNATIONAL SEARCHING AUTHORITY

Choice of International Searching Authority (ISA)
(if two or more International Searching Authorities are competent to carry out the international search, indicate the Authority chosen; the two-letter code may be used):

ISA / EP

Request to use results of earlier search; reference to that search (if an earlier search has been carried out by or requested from the International Searching Authority):

Date (day/month/year)	Number	Country (or regional Office)
(10 AUG 98) 10/08/98	SN30358NL	NL

Box No. VIII CHECK LIST; LANGUAGE OF FILING

This international application contains the following number of sheets:

request	: 6
description (excluding sequence listing part)	: 16
claims	: 3
abstract	: 1
drawings	: 3
sequence listing part of description	:

Total number of sheets : 29

This international application is accompanied by the item(s) marked below:

1. ☒ fee calculation sheet
2. ☐ separate signed power of attorney
3. ☒ copy of general power of attorney; reference number, if any:
4. ☐ statement explaining lack of signature
5. ☒ priority document(s) identified in Box No. VI as item(s): 1
6. ☐ translation of international application into (language):
7. ☐ separate indications concerning deposited microorganism or other biological material
8. ☐ nucleotide and/or amino acid sequence listing in computer readable form
9. ☒ other (specify): transl.pri.doc. / copy search report

Figure of the drawings which should accompany the abstract: 4

Language of filing of the international application: ENGLISH

Box No. IX SIGNATURE OF APPLICANT OR AGENT

Next to each signature, indicate the name of the person signing and the capacity in which the person signs (if such capacity is not obvious from reading the request).

KONINKLIJKE KPN N.V.


KLEIN Bart

Professional Representative

For receiving Office use only		2. Drawings: <input checked="" type="checkbox"/> received: <input type="checkbox"/> not received:
1. Date of actual receipt of the purported international application:	02 DEC 1998 (02. 12. 1998)	
3. Corrected date of actual receipt due to later but timely received papers or drawings completing the purported international application:		
4. Date of timely receipt of the required corrections under PCT Article 11(2):		
5. International Searching Authority (if two or more are competent): ISA /	6. <input type="checkbox"/> Transmittal of search copy delayed until search fee is paid.	

For International Bureau use only
Date of receipt of the record copy by the International Bureau:

Sheet 5

Continuation of Box No. IX SIGNATURE OF APPLICANT OR AGENT

WENTINK Maarten Menzo

A handwritten signature in black ink, appearing to read 'Wentink', is written over a rectangular box. The signature is stylized with a large initial 'W' and a horizontal line at the end.

Continuation of Box No. IX SIGNATURE OF APPLICANT OR AGENT

VISSER Michaël Maria

A handwritten signature in dark ink, appearing to read 'M. Visser', is written within a rectangular box.